Compuprint 4247 Serial Matrix Printers

Compuprint 4247 Model L03 Printer: Programmer Manual

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Before using this information and the product it supports, read the information in “Notices” on page 185.

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This edition applies to the Compuprint 4247 L03 printer and to all subsequent releases and modifications until otherwise indicated in new edition.

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Preface

This publication provides information about the commands supported by your printer. The commands are organized by function groups. Each command has both a brief and a detailed description.

Each command has the following structure:

- Name and function description. Information about protocol (IBM® Proprinter XL24/XL24 AGM, IBM Personal 2391+, EPSON LQ Series, ANSI 3.64).
- The hexadecimal and decimal codes for the command: n represents variable parameters of the command. The functions of these parameters are explained in its corresponding command description.

Chapter 1. Command Summary in Alphabetical Order

This section contains a summary of commands used on the 4247-L03 model printer. It is divided into 2 separate sections. “Common commands for the 4247-L03 model printers” lists all the commands common to both the Single Byte Character Set (SBCS) and Double Byte Character Set (DBCS) features. “Commands for the 4247 model printer with the DBCS feature present” on page 5 lists commands that can only be used when the DBCS feature is present.

Common commands for the 4247-L03 model printers

The following commands are common for both of the 4247-L03 model printers.

Command	Description	Page
BEL	Buzzer (IBM/EPSON).	45
BEL	Bell (ANSI).	79
BS	Print and space back one position (IBM/EPSON).	45
BS	Back space (ANSI).	72
CAN	Cancels line. (EPSON)	43
CAN	Cancels data. (IBM)	43
CR	Prints all received data and the column counter is set to the left margin (IBM/EPSON).	7
CR	Carriage return (ANSI).	72
DC1	Selects printer. (IBM)	43
DC1	Selects printer. (EPSON)	43
DC1	Selects printer (Data Control 1) (ANSI).	78
DC2	Sets 10 cpi printing. (IBM)	19
DC2	Cancels compressed printing. (EPSON)	19
DC3	Deselects printer. (EPSON)	43
DC3	Deselects printer (Data Control 3) (ANSI).	79
DC4	Cancels double width printing (IBM/EPSON).	19
DC4 DC4 ESC !	Bar Code Selection.	54
DC4 DC4 ESC (GS	Prints bar code symbols.	61
DC4 DC4 ESC @	Re-initializes the printer.	62
DC4 DC4 ESC 1	Sets vertical spacing *n*/180 inch.	51
DC4 DC4 ESC 3 1	Sets vertical spacing 12 lines/30 mm.	51
DC4 DC4 ESC 3 3	Sets vertical spacing to 3 lines/30 mm.	51
DC4 DC4 ESC 3 4	Sets vertical spacing 4 lines/30 mm.	51
DC4 DC4 ESC 3 6	Sets vertical spacing 6 lines/30 mm.	52
DC4 DC4 ESC 3 8	Sets vertical spacing 8 lines/30 mm.	52
DC4 DC4 ESC A	Sets the horizontal spacing to 15, 17.1, 20, 24 CPI.	52
DC4 DC4 ESC D	Sends the operator panel messages to the serial I/F.	65
DC4 DC4 ESC v	Selects graphics print speed.	65
DC4 DC4 ESC g	Selects LQ fonts.	53
DC4 DC4 ESC J	Sets amplification factor.	62
DC4 DC4 ESC N	Selects/loads or parks the fanfold from the Front 2 path.	62
DC4 DC4 ESC p	Sets quality printing.	62
DC4 DC4 ESC R	String rotation.	63
DC4 DC4 ESC r	Digit rotation.	63
DC4 DC4 ESC S	Selects character set ISO Character Sets or Code Pages.	53
DC4 DC4 ESC T	Selects/loads or parks the fanfold from the Front1 path.	63
DC4 DC4 ESC u	Selects the user macros.	64
DC4 DC4 ESC v	Selects graphics print speed.	65
DC4 DC4 ESC Y	Selects emulation.	64
DC4 DC4 ESC Z	Makes AGA in column.	64
DEL	Deletes the last character. (EPSON)	44

DEL	Delete (ANSI).	79
ENQ	Enquiry (ANSI).	78
ESC	Escape (ANSI).	79
ESC –	Sets or cancels underlined printing (IBM/EPSON).	19
ESC [p_1 a	Horizontal position relative (HPR) (ANSI).	73
ESC [p_1; ... p_n h	Sets mode (SM) (ANSI).	80
ESC [p_1 d	Vertical position absolute (VPA) (ANSI).	75
ESC [p_1 q	Select graphics mode/density (GRM) (ANSI).	82
ESC p_1; p_n l	Resets mode (RM) (ANSI).	81
ESC [p_1; p_n v	Sets vertical tab stops at specified positions (Multiple Vertical Tab Set - VTS) (ANSI).	77
ESC !	Sets printing style. (EPSON)	20
ESC #	Cancels MSB control. (EPSON)	44
ESC $	Sets the absolute printing position. (EPSON)	8
ESC %	Selects user-defined character set. (EPSON)	36
ESC &	Defines the 24-pin download characters. (EPSON)	36
ESC (–	Sets score line. (EPSON)	20
ESC *	Sets dot graphics printing. (IBM XL24 AGM, EPSON)	39
ESC /	Selects the Vertical Format Unit (VFU) channel. (EPSON)	9
ESC :	Sets 12 CPI. (IBM)	21
ESC :	Copies characters from ROM to RAM. (EPSON)	37
ESC ?	Reassigns dot graphics mode. (EPSON)	40
ESC @	Initializes the printer. (EPSON)	45
ESC [–	Selects the score line. (IBM 2391 + only)	21
ESC [I	Sets font and pitch of a character. (IBM 2391 + only)	24
ESC [p_1 '	Horizontal position absolute (HPA) (ANSI).	73
ESC [p_1 k	Vertical position backward (VPB) (ANSI).	76
ESC [p_1 x	Selects national character set (Select National Characters - SNC) (ANSI).	68
ESC [p_1; p_2 f	Horizontal and vertical position absolute (HVP) (ANSI).	76
ESC [p_1; p_2 SP~	Selects emulation (EMU) (ANSI).	81
ESC [p_1; p_n {	Unidirectional printing (UDP) (ANSI).	72
ESC [p_1; p_n }	Sets bar code parameters (BC) (ANSI).	84
ESC [@	Selects the printing type style. (IBM 2391 + only)	22
ESC [@	Sets double high printing and double line feed. (IBM)	22
ESC [\	Sets vertical units. (IBM)	9
ESC [d	Set the print quality. (IBM 2391 + only)	23
ESC [g	Selects 8 or 24 needle dot graphics mode. (IBM)	42
ESC [K	Sets initial conditions. (IBM 2391 + only)	45
ESC [p_1 e	Vertical position relative (VPR) (ANSI).	75
ESC [p_1 j	Horizontal position backward (HPB) (ANSI).	73
ESC [p_1 t	Special print mode (Oversize/Expanded/Bar code Mode - SPM) (ANSI).	71
ESC [p_1; p_2 <SP> G	Sets the line/character spacing (ANSI).	78
ESC [p_1; p_2 s	Left/right margin set (SLR) (ANSI).	73
ESC [p_1; p_2 SP B	Graphic size modification (GSM) (ANSI).	71
ESC [p_1; p_2; p_3 r	Form definition (FD) (ANSI).	77
ESC [p_1; p_n g	Tab clear (TBC) (ANSI).	76
ESC [p_1; ... p_n m	Select graphics rendition (SGR) (ANSI).	70
ESC [T	Selects a Code page (IBM).	32
ESC \	Sets the relative dot position. (EPSON)	9
ESC \	Prints characters from all characters table. (IBM)	32
ESC \ or ST	String terminator (ANSI).	80
ESC]	Sets a reverse line feed. (IBM)	7
ESC ^	Prints a single character from the all characters table. (IBM)	33
ESC _	Sets or cancels overscore printing. (IBM)	25
ESC +	Sets *n*/360-inch line spacing. (IBM)	10
ESC <	Prints characters for one line from left to right. (EPSON)	21

ESC =	Defines downloaded characters. (IBM)	38
ESC =	Sets MSB to 0. (EPSON)	44
ESC >	Sets MSB to 1. (EPSON)	44
ESC 0	Sets vertical spacing to 1/8 inch (IBM/EPSON).	10
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ESC 2	Sets the vertical spacing to 1/6 inch. (EPSON)	10
ESC 2	Enables the vertical spacing set by ESC A. (IBM)	10
ESC 3	Sets vertical spacing to *n*/180 inch. (IBM XL24 AGM, EPSON)	11
ESC 3	Sets vertical spacing to *n*/216 inch. (IBM XL24, 2391 +)	11
ESC 4	Sets the current position as top of form (first printable line). (IBM)	11
ESC 4	Sets italics printing mode. (EPSON)	25
ESC 5	Sets an automatic line feed after a carriage return. (IBM)	7
ESC 5	Cancels italics printing. (EPSON)	25
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ESC B	Sets vertical tab stops (IBM/EPSON).	12
ESC b	Sets vertical tab stops in one of the 8 Vertical Format Unit channels available. (EPSON)	12
ESC B NUL	Resets vertical tab stops (IBM/EPSON).	12
ESC b NUL	Resets vertical tab stops in one of the 8 Vertical Format Unit channels available. (EPSON)	13
ESC c	Resets to initial state (RIS) (ANSI).	80
ESC C 0 *n*	Sets form length to n inches (IBM/EPSON).	13
ESC C *n*	Sets form length to n lines (IBM/EPSON).	13
ESC D	Sets horizontal tab stops (IBM/EPSON).	13
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ESC K	Normal density dot graphics printing (60 dpi) (IBM/EPSON).	40
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ESC K or PLD	Partial line down (ANSI).	75
ESC l	Sets left margin. (EPSON)	14
ESC L	Double density dot graphics printing (120 dpi) (IBM/EPSON).	41
ESC L or PLU	Partial line up (ANSI).	75
ESC M	Selects 10.5 point. 12 CPI. (EPSON)	27
ESC M or RI	Reverse index (ANSI).	75
ESC N	Sets the skipover perforation to *n* lines (IBM/EPSON).	15
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ESC p	Sets or cancels proportional printing. (EPSON)	28
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ESC Q	Deselects Printer. (IBM)	44
ESC Q or PU1	Executes Selftest (ANSI).	80
ESC R	Sets horizontal and vertical tab stops to default values. (IBM)	17
ESC R	Selects Nation character set. (EPSON)	34
ESC S	Sets subscript or superscript printing (IBM/EPSON).	29
ESC s	Sets and resets Quiet printing. (EPSON)	29
ESC SP	Sets intercharacter space. (EPSON)	17
ESC T	Cancels subscript or superscript printing (IBM/EPSON).	30
ESC t	Selects characters table. (EPSON)	34
ESC U	Sets printing direction (IBM/Epson).	47
ESC [u *n*	Bar Codes selection. (IBM - Epson)	48
ESC [v n m	Sets Barcode parameters. (IBM - Epson)	48
ESC W	Sets or cancels double width printing (IBM/EPSON).	30
ESC w	Sets or cancels double height printing. (EPSON)	30
ESC X	Sets left and right margins. (IBM)	17
ESC x	Selects Letter Quality or Draft. (EPSON)	30
ESC Y	Double density dot graphics printing at double-speed graphics (120 virtual dpi) (IBM/EPSON).	41
ESC Z	Quadruple density dot graphics printing (240 virtual dpi) (IBM/EPSON).	42
ESC [p_1; p_n u	Sets horizontal tab stops at specified positions multiple horizontal tab set (HTS) (ANSI).	74
FF	Advances paper to the top of the next page (IBM/EPSON).	18
FF	Form feed (ANSI).	77
HT	Logically moves the print carriage to the next horizontal tab stop (IBM/EPSON).	18
HT	Horizontal tab (ANSI).	73
LF	Line Feed (IBM/EPSON).	8
LF	Line feed (ANSI).	74
NUL	Ignored (ANSI).	78
SI	Sets compressed printing. (EPSON)	31
SI	Shift in (ANSI).	71
SI or ESC SI	Sets compressed printing (IBM/EPSON).	29
SO	Sets double width printing (one line) (IBM/EPSON).	31
SO	Shift out (ANSI).	71
SO or ESC SO	Sets double width printing (one line) (IBM/EPSON).	29
SP	Space (ANSI).	72
VT	Advances paper to the next vertical tab stop of the selected VFU channel (IBM/EPSON).	18
VT	Vertical tab (ANSI).	76

Commands for the 4247 model printer with the DBCS feature present

The following commands are used only with the 4247 model printer with the DBCS feature present.

Command	Description	Page
ESC | *n*	Sets – Resets double width and double height print modes.	96
ESC (X *n*1 *n*2 *a*1 *a*2 *a*3	Defines a special printing effect.	96
FS &	Enter the DBCS print mode.	89
FS .	Exit the DBCS print mode.	89
FS ! *n*	Sets multiple print attribute at once.	94
FS - *n*	Sets - Resets underline mode.	91
FS 2 a^1 a^2 n^1 ... n^{72}	Sets user-defined character (DownLoading).	94
FS *b n*	Sets the DBCS standard line.	95
FS *c nl nh*	Sets the HMI (Horizontal Motion Index)	95
FS D *d*1 *d*2	Composes two half-width, rotated characters into a normal size rotated character space.	91
FS DC2	Cancels half-sized and 1/4-sized print and restores normal size print.	93
FS DC4	Resets double width mode.	90
FS J	Sets 90 degrees counterclockwise character rotation.	90
FS K	Resets character rotation.	91
FS S *n*1 *n*2	Defines the left and right empty character space of a normal-sized character.	92
FS SI	Sets the print of half-sized characters.	93
FS SO	Sets double width mode.	90
FS *r n*	Sets superscript or subscript print mode (1/4 normal size).	93
FS T *n*1 *n*2	Defines the left and right empty character space of a half-sized character.	92
FS U	Define half-sized character as half of a normal sized character.	92
FS *v n*	Sets - Cancels line drawing character connection mode.	95
FS V	Resets print of half-sized characters.	93
FS W *n*	Sets - Resets quadruple print mode.	90
FS *x n*	Sets print quality level for the DBCS font set.	94

Chapter 2. EPSON/IBM Mode

The following printer commands are supported by this printer according to the IBM Proprinter XL24-XL24 AGM, IBM 2391+ and EPSON LQ Series.

Print and Line Feed Execution

CR

Prints all received data and the column counter is set to the left margin (IBM/EPSON).

ASCII Code	CR
Hexadecimal Value	X'0D'
Decimal Value	13

This code is a terminator code; when received, it causes any data in the buffer to be printed out. The print head then moves logically to the left margin position. The column counter is set to the left margin value and a line feed is inserted automatically after the carriage return (see the automatic carriage return function in the printer setup). The code cancels the double width printing set by the SO or ESC SO command.

ESC]

Sets a reverse line feed. (IBM)

ASCII Code	ESC]
Hexadecimal Value	X'1B' X'5D'
Decimal Value	27 93

This is a terminator code; it therefore causes the current contents of the print buffer to be printed before advancing the paper by one line at the current vertical spacing. If no data precedes the LF code, or if the preceding data consists of spaces, the code only causes a line feed.

When the line counter reaches the last line of the form (defined by the software or the function menu), the LF code causes a skip to the first line of the next form. This code cancels the double width printing set by the SO code. In IBM mode, the column counter is set to the first column if the automatic carriage return is selected. In EPSON mode, the column is always set to the first column.

ESC 5

Sets an automatic line feed after a carriage return. (IBM)

ASCII Code	ESC 5 *n*
Hexadecimal Value	X'1B' X'35' *n*
Decimal Value	27 53 *n*

If *n* is equal to 1, this command sets an automatic line feed on receiving of a CR code. If *n* is equal to 0, this command cancels the automatic line feed.

n	Automatic line feed
0	Disabled
1	Enabled

ESC J

Advances paper *n*/180 inch. (EPSON and IBMXL24AGM)
Advances paper n/216 inch. (IBMXL24 and 2391)

ASCII Code	ESC J *n*
Hexadecimal Value	X'1B' X'4A' *n*
Decimal Value	27 74 *n*
Range	1 ≤ *n* ≤ 255

This is a terminator code; it causes the current contents of the print buffer to be printed before performing a single line feed of *n*/180 or *n*/216 of an inch. This command is cancelled after the line feed has been performed. The printing restarts after a line feed from the column at which the command was sent.

LF

Line Feed (IBM/EPSON).

ASCII Code	LF
Hexadecimal Value	X'0A'
Decimal Value	10

This is a terminator code; it causes the current contents of the print buffer to be printed before advancing the paper by one line at the current vertical spacing. If no data precedes the LF code, or if the preceding data consists of spaces, the code only causes a line feed.

When the line counter reaches the last line of the form (defined by software or function menu), the LF code causes a skip to the first line of the next form. This code cancels the double width printing set by the SO code. In IBM mode, the column counter is set to the first column if the automatic carriage return is selected. In EPSON mode, the column is always set to the first column.

Format Control

ESC $

Sets the absolute printing position. (EPSON)

ASCII Code	ESC & n_1 n_2
Hexadecimal Value	X'1B' X'24' n_1 n_2
Decimal Value	27 36 n_1 n_2
Range	0 ≤ n_1 n_2 ≤ 255

This command specifies the distance from the left margin to where you want to print subsequent characters. The distance is in number of dots and must be calculated using the following formula:

Margin distance = n_1 + (n_2 x 256) where n_2 is the integer result of the number of dots divided by 256 and n_1 is the remainder. 1 dot = 1/60 inch. If the selected position is outside the current right margin, the sequence is ignored.

ESC [\

Sets vertical units. (IBM)

ASCII Code	ESC [\ m_1 m_2 t_1 ... t_4
Hexadecimal Value	X'1B' X'5B' X'5C' m_1 m_2 t_1 ... t_4
Decimal Value	27 91 92 m_1 m_2 t_1 ... t_4
Range	$m_1 = 4$ $m_2 = 0$ $0 \le t_1 \le 255$ $0 \le t_2 \le 255$ $t_3 = 0$ $t_4 = 180$ or 216

This command changes the base units for the graphics line spacing commands (ESC J, ESC 3). The default is 1/216 or 1/180 inch.

ESC /

Selects the Vertical Format Unit (VFU) channel. (EPSON)

ASCII Code	ESC / m
Hexadecimal Value	X'1B' X'2F' m
Decimal Value	27 47 m
Range	$0 \le m \le 7$

This sequence selects the VFU channel that you want to use. Eight different channels are available. The *m* parameter represents the channel you want to select.

ESC \

Sets the relative dot position. (EPSON)

ASCII Code	ESC \ n_1 n_2
Hexadecimal Value	X'1B' X'5C' n_1 n_2
Decimal Value	27 92 n_1 n_2
Range	$0 \le n_1, n_2 \le 255$

This command specifies the distance between the current print head position and the position where you want to print subsequent characters (relative position). The distance is a number of dots and must be calculated using the following formula:

Current position distance = $n_1 + (n_2 \times 256)$

where n_2 is the integer result of the number of dots divided by 256 and the *n*1 is the remainder. The unit of dots is 1/120 inch for Draft or 1/180 inch for Letter Quality printing. If the distance is negative (Most Significant Bit of m_2 equal to 1), the print head is moved to the left of the current position by the number of dots equal to the complement on two of $n_1 + (n_2 \times 256)$.

ESC 0

Sets vertical spacing to 1/8 inch (IBM/EPSON).

ASCII Code	ESC 0
Hexadecimal Value	X'1B' X'30'
Decimal Value	27 48

This code causes vertical spacing to be set to 1/8 inch.

ESC 1

Sets vertical spacing to 7/72 inch. (IBM)

ASCII Code	ESC 1
Hexadecimal Value	X'1B' X'31'
Decimal Value	27 49

This command causes vertical spacing to be set to 7/72 inch.

ESC +

Sets *n*/360-inch line spacing. (IBM)

ASCII Code	ESC + *n*
Hexadecimal Value	X'1B' X'2B' *n*
Decimal Value	27 43 *n*
Range	0 ≤ *n* ≤ 255

This command sets the line spacing to *n*/360 inch. If the line spacing is changed, it does not affect previous settings for vertical tabs or page length.

ESC 2

Sets the vertical spacing to 1/6 inch. (EPSON)

ASCII Code	ESC 2
Hexadecimal Value	X'1B' X'32'
Decimal Value	27 50

This command causes the vertical spacing to be set to 1/6 inch.

ESC 2

Enables the vertical spacing set by ESC A. (IBM)

ASCII Code	ESC 2
Hexadecimal Value	X'1B' X'32'
Decimal Value	27 50

This command enables the vertical spacing sets by ESC A.

ESC 3

Sets vertical spacing to *n*/180 inch. (IBM XL24 AGM, EPSON)

ASCII Code	ESC 3 *n*
Hexadecimal Value	X'1B' X'33' *n*
Decimal Value	27 51 *n*
Range	1 ≤ *n* ≤ 255

This sequence sets the vertical spacing to *n*/180 inch. It is ignored if *n* is equal to 0.

ESC 3

Sets vertical spacing to *n*/216 inch. (IBM XL24, 2391 +)

ASCII Code	ESC 3 *n*
Hexadecimal Value	1B 33 *n*
Decimal Value	X'27' X'51' *n*
Range	0 ≤ *n* ≤ 255

This sequence sets the vertical spacing to *n*/216 inch.

ESC 4

Sets the current position as top of form (first printable line). (IBM)

ASCII Code	ESC 4
Hexadecimal Value	X'1B' X'34'
Decimal Value	27 52

This sequence sets the first line of the fanfold paper as the current paper position of the form.

ESC A

Sets variable vertical spacing to *n*/60 inch. (IBM XL24 AGM, EPSON)

ASCII Code	ESC A *n*
Hexadecimal Value	X'1B' X'41' *n*
Decimal Value	27 65 *n*

This command changes the default vertical spacing to *n*/60 inch. The new vertical spacing value is immediately activated.

ESC A

Sets variable vertical spacing to *n*/72 inch. (IBM XL24, 2391 +)

ASCII Code	ESC A *n*
Hexadecimal Value	X'1B' X'41' *n*
Decimal Value	27 65 *n*

This command changes the default vertical spacing to *n*/72 inch. The vertical spacing value is stored and activated only after the ESC 2 code is received.

ESC B

Sets vertical tab stops (IBM/EPSON).

ASCII Code	ESC B n_1 ... n_x *0*
Hexadecimal Value	X'1B' X'42' n_1 ... n_x *0*
Decimal Value	27 66 n_1 ... n_x *0*
Range	1 ≤ *n* ≤ 255

In EPSON mode, it sets the vertical tab stops in the 0 Vertical Format Unit (VFU) channel. This code sets up to 16 vertical tab stops at the line specified by n_1, n_2 and so on in the 0 VFU channel. The tab stops are memorized as physical positions. In IBM mode, this code sets up to 64 vertical tab stops at the line number specified by n_1, n_2 and so on in the 0 VFU channel. The tab stops are retained as logical positions.

ESC B NUL

Resets vertical tab stops (IBM/EPSON).

ASCII Code	ESC B NUL
Hexadecimal Value	X'1B' X'42' *00*
Decimal Value	27 66 *00*

This command resets the vertical tab stops in the 0 Vertical Format Unit (VFU) channel.

ESC b

Sets vertical tab stops in one of the 8 Vertical Format Unit channels available. (EPSON)

ASCII Code	ESC b *m* n_1 ... n_x *0*
Hexadecimal Value	X'1B' X'62' *m* n_1 ... n_x *00*
Decimal Value	27 98 *m* n_1 ... n_x *0*
Range	0 ≤ *m* ≤ 7 1 ≤ n_1 ... n_x ≤ 255

This sequence sets vertical tabulations in the VFU channel specified by the parameter *m*.

The VFU channel can be imagined as a blank page where you can set up to 16 vertical tabulations in order to format your page as you like. 8 channels are available and in each of them you can create a sample page that you can recall later. n_1 to n_{16} specify the lines at which vertical tabulations must be set.

The values of *n* must be in ascending order. If you change the vertical spacing, the vertical tabulations set are not cancelled and they maintain their physical position on the page.

The vertical tabulations set in the channel specified by the *m* parameter are executed by the VT code when the specific channel is selected by the ESC / command, this code is executed as a line feed.

ESC b NUL

Resets vertical tab stops in one of the 8 Vertical Format Unit channels available. (EPSON)

ASCII Code	ESC b NUL
Hexadecimal Value	X'1B' X'62' X'00'
Decimal Value	27 98 0

This command resets the vertical tab stops in one of the 8 Vertical Format Unit channels available.

ESC C 0 *n*

Sets form length to *n* inches (IBM/EPSON).

ASCII Code	ESC C 0 *n*
Hexadecimal Value	X'1B' X'43' X'00' *n*
Decimal Value	27 67 0 *n*
Range	
	1 ≤ *n* ≤ 24

This command sets the form length to the number of inches specified by *n*. The current position of the paper is assumed as the top-of-form.

ESC C *n*

Sets form length to *n* lines (IBM/EPSON).

ASCII Code	ESC C *n*
Hexadecimal Value	X'1B' X'43' *n*
Decimal Value	27 67 *n*
Range	
	1 ≤ *n* ≤ 255

This command sets the form length to the number of lines specified by *n* at the current vertical spacing. The current position of the paper is assumed as top-of-form.

ESC D

Sets horizontal tab stops (IBM/EPSON).

ASCII Code	ESC D n_1 n_2 ... n_x *0*
Hexadecimal Value	X'1B' X'44' n_1 n_2 ... n_x *00*
Decimal Value	27 68 n_1 n_2 ... n_x *0*
Range	
	1 ≤ *n* ≤ 255

This sequence sets up to 28 (IBM mode) or 32 (EPSON mode) horizontal tab stops after canceling the current setting. The n_1 to n_x parameters specify the number of columns at which horizontal tab stops are required and must be entered in the sequence in ascending numerical order. Any value outside this range is ignored. In IBM mode, the tab stop position is retained as a logical position in the page so that it is affected by changing the horizontal spacing. The columns are numbered 1 through 136. In EPSON mode, the tab stop position set by ESC D is retained as the physical position on the page and therefore it is not

affected by changing the horizontal spacing. The physical position of the tab stop depends on the horizontal spacing in operation when ESC D is used. The ESC D 0 cancels all active tab stops.

ESC d

Spaces forwards relative dot position. (IBM)

ASCII Code	ESC d n_1 n_2
Hexadecimal Value	X'1B' X'64' n_1 n_2
Decimal Value	27 100 n_1 n_2
Range	$0 \le n_1\ n_2 \le 255$

This command moves the print carriage (n_1 + (n_2*256))/120 of an inch displacement on the right of its current dot position. If the selected position is outside the current right margin, it is forced to the last column.

ESC e

Spaces backward relative dot position. (IBM)

ASCII Code	ESC e n_1 n_2
Hexadecimal Value	X'1B' X'65' n_1 n_2
Decimal Value	27 101 n_1 n_2
Range	$0 \le n_1\ n_2 \le 255$

This command moves the print carriage (n_1 + (n_2*256))/120 of an inch displacement on the left of its current dot position. If the selected position is outside the current left margin, it is forced to the first column.

ESC l

Sets left margin. (EPSON)

ASCII Code	ESC l n
Hexadecimal Value	X'1B' X'6C' n
Decimal Value	27 108 n
Range	$0 \le n \le 255$

This code sets the left margin at the current horizontal spacing. It must be sent at the beginning of the line. The *n* parameter specifies the number of columns. For each type of horizontal spacing there is a different range of possible values, as shown in the following table:

Character Width	Horizontal Spacing	Range of columns
Double Width	5	$0 \le n \le 67$
	6 cpi	$0 \le n \le 80$
	7.5 cpi	$0 \le n \le 100$
	8.5 cpi	$0 \le n \le 114$
	10 cpi	$0 \le n \le 134$

Character Width	Horizontal Spacing	Range of columns
Normal	10 cpi	0 ≤ *n* ≤ 134
	12 cpi	0 ≤ *n* ≤ 160
	15 cpi	0 ≤ *n* ≤ 201
	17 cpi	0 ≤ *n* ≤ 229
	20 cpi	0 ≤ *n* ≤ 255
	24 cpi	0 ≤ *n* ≤ 255

Any value outside the accepted range is ignored and the previous setting remains in effect. The left margin must be smaller than the right margin. The physical position set for the left margin does not change if the horizontal spacing is modified. This command overrides the menu setting.

ESC N

Sets the skipover perforation to *n* lines (IBM/EPSON).

ASCII Code ESC N *n*

Hexadecimal Value X'1B' X'4E' *n*

Decimal Value 27 78 *n*

Range

1 ≤ *n* ≤ 127 (EPSON mode)
1 ≤ *n* ≤ 255 (IBM mode)

The skipover perforation is the sum of the top and bottom margin values at the selected vertical spacing. The *n* parameter must be less than the current form length. The skipover is retained as the physical position on the page. It is cancelled by ESC O or changing the form length.

The skipover value, when accepted, sets the top and bottom margins according to the operator panel setting (see the *User Manual*):

If the top margin set using the operator panel is greater than the skipover value, the following value of the margins is set:

Top margin = skipover value

Bottom margin = 0

If the top margin set using the operator panel is less than or equal to the skipover value, then the following value of the margins is set:

Top margin = operator panel value

Bottom margin = the difference between skipover value and top margin value

If the sum of the top and bottom margins values set using the operator panel is less than the skipover value, the following values for the margins is set:

Top margin = operator panel value

Bottom margin = the difference between skipover value and top margin value

Changing the vertical spacing does not affect the skipover distance. This can be changed by another ESC N command or can be reset by the ESC O command, which resets the skipover value to 0. The skipover perforation is performed when the end of the page is reached with a LF, VT or FF code and not with the ESC J or ESC C command. The skipover perforation is cancelled and must be reset.

ESC O

Disables the skipover perforation (IBM/EPSON).

ASCII Code	ESC O
Hexadecimal Value	X'1B' X'4F'
Decimal Value	27 79

This sequence sets the number of lines of the skipover perforation to the value 0. Any skip perforation set by ESC N is cancelled.

ESC Q

Sets the right margin. (EPSON)

ASCII Code	ESC Q *n*
Hexadecimal Value	X'1B' X'51' *n*
Decimal Value	27 81 *n*
Range	1 ≤ *n* ≤ 225

This code sets the line length at the current horizontal spacing. It must be sent at the beginning of the line.

The *n* parameter specifies the number of columns and for each type of horizontal spacing there is a range of values, as shown in the following table:

Character Width	Horizontal Spacing	Range of columns
Double Width	5	1 ≤ *n* ≤ 67
	6 cpi	1 ≤ *n* ≤ 81
	7.5 cpi	1 ≤ *n* ≤ 101
	8.5 cpi	1 ≤ *n* ≤ 111
	10 cpi	1 ≤ *n* ≤ 135
Normal	10 cpi	1 ≤ *n* ≤ 135
	12 cpi	1 ≤ *n* ≤ 162
	15 cpi	1 ≤ *n* ≤ 203
	17 cpi	1 ≤ *n* ≤ 232
	20 cpi	1 ≤ *n* ≤ 255
	24 cpi	1 ≤ *n* ≤ 255

Any value outside the accepted range is ignored and the previous setting remains in effect. The right margin must be greater than the left margin. The physical position set for the right margin does not change if the horizontal spacing is modified.

ESC R

Sets horizontal and vertical tab stops to default values. (IBM)

ASCII Code	ESC R
Hexadecimal Value	X'1B' X'52'
Decimal Value	27 82

This command sets horizontal tab stops every eight columns starting from column 9 and cancels all vertical tab stops.

ESC SP

Sets intercharacter space. (EPSON)

ASCII Code	ESC SP *n*
Hexadecimal Value	X'1B' X'20' *n*
Decimal Value	27 32 *n*
Range	0 ≤ *n* ≤ 225

This command sets the intercharacter space to *n*/120 inch in Draft printing and *n*/180 inch in Quality printing.

ESC X

Sets left and right margins. (IBM)

ASCII Code	ESC X n_1 n_2
Hexadecimal Value	X'1B' X'58' n_1 n_2
Decimal Value	27 88 n_1 n_2
Range	0 ≤ *n* ≤ 134 (left margin) 2 ≤ *n* ≤ 136 (right margin)

This command sets the left and right margins at the same time. The n_1 and n_2 parameters indicate respectively the number of columns for the left and right margins at the current spacing. These margins are retained in terms of absolute displacement from the physical left edge of the page. Use a CR immediately after ESC X *n* to establish the print head position relative to the new margin setting.

If n_1 is equal to 0, the current left margin of the page is used. If n_2 is equal to 1, the current right margin of the page is used. The left margin value must be less than the right margin value. The right margin value must not exceed the physical right edge of the paper; otherwise the maximum acceptable value for the right margin will be set.

FF

Advances paper to the top of the next page (IBM/EPSON).

ASCII Code	FF
Hexadecimal Value	X'0C'
Decimal Value	12

This code is a terminator code, when received, causes all data in the print buffer to be printed out. Then it advances the paper to the first printable line of the next form. The line counter is set to the first line value and the column counter is set to the left margin value. This code cancels the double width printing set by SO code.

HT

Logically moves the print carriage to the next horizontal tab stop (IBM/EPSON).

ASCII Code	HT
Hexadecimal Value	X'09'
Decimal Value	9

This code logically moves the print carriage to the next horizontal tab stop as defined by ESC D. Up to 28 (IBM mode) or 32 (EPSON mode) horizontal tab stops can be set. The HT code is ignored if no tab stop is set, the current print carriage position is moved past the last tab position, or the tab stop is on or beyond the right margin. When the printer is powered on, the tab stops are set every eight columns (default).

In EPSON mode, the default tab stops are retained as logical positions in the page that are affected by changing the horizontal spacing. The tab stop positions set by ESC D are retained as physical positions on the page and are not affected by changing the horizontal spacing. When double width printing is selected, the tab stop setting must take into account that each character occupies two columns. In IBM mode, the tab stops, both the default and those set by ESC, are retained as logical positions in the page that are affected by changing the horizontal spacing. The horizontal tab stops can be changed by the ESC D command.

VT

Advances paper to the next vertical tab stop of the selected VFU channel (IBM/EPSON).

ASCII Code	VT
Hexadecimal Value	X'0B'
Decimal Value	11

This is a terminator code and when received causes the contents of the print buffer to be printed before advancing the paper to the next vertical tab stop set by the ESC B or the ESC b commands.

This code is run normally if vertical tab stops follow the current print position. It runs like an FF code (EPSON mode) or like a LF code (IBM mode), if the vertical tab stops follow the bottom of form position (corresponding to the form length if the bottom of the form has not been set), or if the current position is beyond the last vertical tab stop. It runs like an LF code if no vertical tab stops have been set by the ESC B or ESC b commands.

In EPSON mode, the vertical tabulations are referred to the VHF channel selected by the ESC / *m*. If no VFU channels have been selected, the printer assumes the default channel 0.

This command cancels the double width printing set by SO or ESC SO command.

Print Mode

DC2

Sets 10 cpi printing. (IBM)

ASCII Code	DC2
Hexadecimal Value	X'12'
Decimal Value	18

This is a terminator code. It causes all data present in the print buffer to be printed. This command is accepted at any position within the line. The character that follows this command is printed at 10 cpi.

DC2

Cancels compressed printing. (EPSON)

ASCII Code	DC2
Hexadecimal Value	X'12'
Decimal Value	18

This is a terminator code. It causes all data present in the print buffer to be printed. This command is accepted at any position within the line. The character that follows this command is printed as follows:

17 CPI → 10 CPI

20 CPI → 12 CPI

DC4

Cancels double width printing (IBM/EPSON).

ASCII Code	DC4
Hexadecimal Value	X'14'
Decimal Value	20

This code cancels the double width printing set by SO or ESC SO code. It has no effect if the ESC W or ESC ! command is set to double width.

ESC –

Sets or cancels underlined printing (IBM/EPSON).

ASCII Code	ESC – *n*
Hexadecimal Value	X'1B' X'2D' *n*
Decimal Value	27 45 *n*

Enables or disables underlined printing. See the following table:

n	Underlined Printing
1	enabled
0	disabled

ESC !

Sets printing style. (EPSON)

ASCII Code ESC ! *n*

Hexadecimal Value X'1B' X'21' *n*

Decimal Value 27 33 *n*

This command is used to select any valid combination of printing attributes. Each printing attribute is selected by the *n* parameter, as specified in the following page:

n	Attribute
0	10 cpi
1	12 cpi
2	Proportional
4	Compressed
8	Emphasized
16	Double Strike
32	Double Width
64	Italics
128	Underline

To print the desired combination of printing attributes, calculate the *n* parameter by adding up the values of each attribute.

ESC (–

Sets score line. (EPSON)

ASCII Code ESC (– n_1 n_2 m d_1 d_2

Hexadecimal Value X'1B' X'28' X'2D' n_1 n_2 m d_1 d_2

Decimal Value 27 40 45 n_1 n_2 m d_1 d_2

Range

$n_1 = 3$
$n_2 = 0$
$m = 1$
$1 \le d_1 \le 3$
$d_2 = 0, 1, 2, 5, 6$

This command enables or disables scoring of all characters and spaces following the command according to the following parameters:

d_1	Line
1	Underline
2	Strikethrough
3	Overscore

d_2	Line
0	Cancel score line
1	Single continuous line
2	Double continuous line
5	Single broken line
6	Single broken line

Any combination of scoring may be used at the same time and are independent of each other. Graphics characters are not scored.

ESC [–

Selects the score line. (IBM 2391 + only)

ASCII Code ESC [– n_1 n_2 *loc type*

Hexadecimal Value X'1B' X'5B' X'2D' n_1 n_2 *loc type*

Decimal Value 27 91 45 n_1 n_2 *loc type*

Range

$n_1 = 2$
$n_2 = 0$

This command selects several forms of overscore, underscore, and strikethrough.

To select *loc*: To select *type*:

loc	Selection	type	Selection
1	Underscore	0	Cancels line
2	Strikethrough	1	Single line
3	Overscore	2	Double line
		255	Cancels all score selections

ESC :

Sets 12 CPI. (IBM)

ASCII Code ESC :

Hexadecimal Value X'1B' X'3A'

Decimal Value 27 58

This is a terminator code. It causes all data present in the print buffer to be printed. Subsequent data is printed at 12 cpi. This command is accepted at any position within the line. The setting of another horizontal spacing resets this command.

ESC <

Prints characters for one line from left to right. (EPSON)

ASCII Code ESC <

Hexadecimal Value X'1B' X'3C'

Decimal Value 27 60

This command causes the printing of one line from left to right.

ESC [@

Selects the printing type style. (IBM 2391 + only)

ASCII Code	ESC [@ *4 0 m_1 0 m_3 m_4*
Hexadecimal Value	X'1B' X'5B' X'40' *04* 00* m_1 00* m_3 m_4*
Decimal Value	27 91 64 *4 0 m_1 0 m_3 m_4*

(*) These values are constants.

This command is used to modify the type style of the character and the number of line spacing. Use this command for:

1. Italic printing
2. Single-high character
3. Double-high character
4. Single-wide character
5. Double-wide character
6. Single Line Feed
7. Double Line Feed

These selections may be combined, for example, italic print with double height or doublewide character and double line feed.

See the following tables for m_1, m_3 and m_4 selections:

m_1	Selection	m_3	Selection	m_4	Selection
0	No Change	0	No Change	0	No Change
1	Start Italic Printing	1	Single-High Character	1	Single-Wide Character
2	Stop Italic Printing	2	Double-High Character	2	Double-Wide Character
4	Start Outline	16	Single Line Feed	16	Single Line Feed
8	Stop Outline	32	Double Line Feed	32	Double Line Feed
16	Start Shadow				
32	Stop Shadow				

ESC [@

Sets double high printing and double line feed. (IBM)

ASCII Code	ESC [@ *l h m_1 m_2 m_3 m_4*
Hexadecimal Value	X'1B' X'5B' X'40' *l h m_1 m_2 m_3 m_4*
Decimal Value	27 91 64 *l h m_1 m_2 m_3 m_4*

l = normally 4, *h* = normally 0, $m_1 = 0$, $m_2 = 0$

This command sets height, width, and vertical spacing.

The *l* and *h* parameters specify the number of mode bytes m_x contained in the sequence.

The m_3 and m_4 parameters specify the printing characteristics.

The m_3 parameter controls both line spacing and character height. It has two parts: a high-order half-byte of m_3 controls the line spacing and the low-order half-byte controls the character height.

m_3	Character Height	Line Spacing
0	No Change	No Change
1	Standard character height	Line feeds unchanged
2	Double character height	Line feeds unchanged
16	Character height unchanged	Normal line feeds
17	Standard character height	Normal line feeds
18	Double character height	Normal line feeds
32	Character height unchanged	Double line feeds
33	Standard character height	Double line feeds
34	Double character height	Double line feeds

The m_4 parameter specifies the character width. Only the low-order half-byte is significant in this mode byte. The high-order half-byte is ignored.

m_4	Character Width	Line Spacing
0	No change	No change
1	Standard width character	No change
2	Double width character	No change

ESC [d

Set the print quality. (IBM 2391 + only)

ASCII Code	ESC [d *1 0 n*
Hexadecimal Value	X'1B' X'5B' X'64' *01 00 n*
Decimal Value	27 91 100 *1 0 n*

This command sets the print quality to draft or LQ print.

n	Types
0	No Change
From 64 to 127	Draft
From 128 to 254	Letter Quality
255	Initialization on NVRAM values

ESC [I

Sets font and pitch of a character. (IBM 2391 + only)

ASCII Code	ESC [I *2 0 m n*
Hexadecimal Value	X'1B' X'5B' X'49' *02 00 m n*
Decimal Value	27 91 73 *2 0 m n*

This command allows you to modify the character's font and style of pitch type.

The values 2 and 0 are constants. If font and pitch locks are active, this command is ignored. To select the values for the variables *m* and *n*, which identify the pitch and the font type style to use, refer to the table below.

1. Identify the type style (pitch and font) to use in the left column (pitch).
2. For the hexadecimal values of *m* and *n*, look across the row to the second column (Hex *m n*)
3. For the decimal values for *m* and *n*, look across the row to the third column (Decimal *m n*).
4. Substitute these values for *m* and *n* in the printer command syntax.

Pitch	Hexadecimal		Decimal		Dec. Value
	m	*n*	*m*	*n*	(*m* x 256 + *n*)
Courier					
10	X'00'	X'00B'	0	11	11
12	X'01'	X'EB'	1	235	491
15	X'01'	X'EC'	1	236	492
17	X'01'	X'ED'	1	237	493
20	X'01'	X'EE'	1	238	494
24	X'01'	X'1E'	1	30	286

Pitch	Hexadecimal		Decimal		Dec. Value
	m	*n*	*m*	*n*	(*m* x 256 + *n*)
Gothic					
10	X'00'	X'24'	0	36	36
12	X'01'	X'8F'	1	143	399
15	X'01'	X'8E'	1	236	398
17	X'01'	X'8D'	1	237	397
20	X'01'	X'8C'	1	238	396
24	X'01'	X'20'	1	30	288
PS	X'01'	X'AE'	1	174	174

Pitch	Hexadecimal		Decimal		Dec. Value
	m	*n*	*m*	*n*	(*m* x 256 + *n*)
Script					
10	X'01'	X'D4'	1	212	468
12	X'01'	X'D5'	1	213	469
15	X'01'	X'D6'	1	214	470
17	X'01'	X'D7'	1	215	471

20	X'01'	X'D8'	1	216	472
24	X'01'	X'24'	1	36	292
PS	X'01'	X'C8'	0	200	200

ESC _

Sets or cancels overscore printing. (IBM)

ASCII Code ESC _ *n*

Hexadecimal Value X'1B' X'5F' *n*

Decimal Value 27 95 *n*

Enables or disables overscore printing. See the following table:

n	Overscore Printing
1	Enabled (all spaces and characters that follow are overscored)
0	Disabled

ESC 4

Sets italics printing mode. (EPSON)

ASCII Code ESC 4

Hexadecimal Value X'1B' X'34'

Decimal Value 27 52

Sets the style attribute of the font to italic. This command selects italic printing even if the italic character table is not selected.

ESC 5

Cancels italics printing. (EPSON)

ASCII Code ESC 5

Hexadecimal Value X'1B' X'35'

Decimal Value 27 53

Sets the style attribute of the font to normal (cancels the italic style attribute previously selected with the ESC 4 command).

ESC a

Sets Letter Quality justification printing. (EPSON)

ASCII Code	ESC a *n*
Hexadecimal Value	X'1B' X'61' *n*
Decimal Value	27 97 *n*
Range	0 ≤ *n* ≤ 3

Selects from four types of justification, as follows:

n	Justification
0	Left
1	Centered
2	Right
3	Allows an uniform printing between the margins when the buffer is full.

ESC E

Sets emphasized printing (IBM/EPSON).

ASCII Code	ESC E
Hexadecimal Value	X'1B' X'45'
Decimal Value	27 69

This command starts emphasized printing. The print head strikes each dot twice to produce a darker, bolder character. The second strike is offset horizontally.

ESC F

Cancels emphasized printing (IBM/EPSON).

ASCII Code	ESC F
Hexadecimal Value	X'1B' X'46'
Decimal Value	27 70

This command ends emphasized printing. This escape sequence cancels emphasized printing that was started by ESC E.

ESC G

Sets double strike printing (IBM/EPSON).

ASCII Code	ESC G
Hexadecimal Value	X'1B' X'47'
Decimal Value	27 71

This command starts double-strike printing. ESC G may be canceled by ESC H.

ESC g

Sets 15 CPI. (EPSON)

ASCII Code	ESC g
Hexadecimal Value	X'1B' X'67'
Decimal Value	27 103

Subsequent data is printed at 15 cpi. This command is accepted at any position within the line. If you change the pitch during proportional mode (selected with the ESC p command), the change takes effect when the printer exits proportional mode.

ESC H

Cancels double strike printing (IBM/EPSON).

ASCII Code	ESC H
Hexadecimal Value	X'1B' X'48'
Decimal Value	27 72

This command cancels double-strike printing set with the ESC G command.

ESC I

Selects printing type for resident and DLL characters. (IBM)

ASCII Code	ESC I *n*
Hexadecimal Value	X'1B' X'49' *n*
Decimal Value	27 73 *n*

This command selects the resident or the download font in Draft or LQ printing mode. It is ignored if you select a font that has not been downloaded or has been overwritten. See the following table:

n	Resident font	*n*	Download font
0	Draft 10 cpi	4	Draft 10 cpi
2	LQ 10 cpi	6	LQ 10 cpi
3	Proportional	7	Proportional
8	Draft 12 cpi	12	Draft 12 cpi
10	LQ 12 cpi	14	LQ 12 cpi
16	Draft 17 cpi	20	Draft 17 cpi
18	LQ 17 cpi	22	LQ 17 cpi

ESC M

Selects 10.5 point, 12 CPI. (EPSON)

ASCII Code	ESC M
Hexadecimal Value	X'1B' X'4D'
Decimal Value	27 77

This is a terminator code. It causes all data present in the print buffer to be printed. Subsequent data is printed at 12 cpi, if you previously set the compressed spacing by sending the SI or ESC SI command. If you select proportional printing, this command is stored.

ESC P

Selects 10.5 point, 10 cpi. (EPSON)

ASCII Code	ESC P *n*
Hexadecimal Value	X'1B' X'50' *n*
Decimal Value	27 80 *n*

This command selects 10.5 point, 10 cpi character printing. If you change the pitch during proportional mode (selected with the ESC p command) the change takes effect when the printer exits proportional mode.

ESC P

Sets or cancels proportional printing. (IBM)

ASCII Code	ESC P *n*
Hexadecimal Value	X'1B' X'50' *n*
Decimal Value	27 80 *n*
Range	1 ≤ *n* ≤ 255

This code is a terminator code. It causes all data in the print buffer to be printed. Then if the *n* parameter is equal to 1, the subsequent data is printed in proportional mode. If the *n* parameter is equal to 0, proportional mode is reset. If the any horizontal spacing command is sent to the printer when the proportional printing is set, the command is stored and activated as soon as the proportional printing is reset.

ESC p

Sets or cancels proportional printing. (EPSON)

ASCII Code	ESC p *n*
Hexadecimal Value	X'1B' X'70' *n*
Decimal Value	27 112 *n*
Range	1 ≤ *n* ≤ 255

This command selects the proportional or fixed spacing according to the following values:

n	Proportional Printing
0	Returns to current fixed character pitch
1	Selects proportional character spacing

The changes made to the fixed-pitch setting with ESC P, ESC M, or ESC g commands during proportional mode take effect when the printer exits proportional mode. The printer automatically switches to LQ mode when the printer exits proportional mode.

ESC S

Sets subscript or superscript printing (IBM/EPSON).

ASCII Code	ESC S *n*
Hexadecimal Value	X'1B' X'53' *n*
Decimal Value	27 83 *n*

Selects subscript or superscript printing. See the following table:

n	Selection
0	Subscript Print enabled
1	Superscript Print enabled

Proportional printing of subscript or superscript characters is performed at 2/3 of the proportional character width. Use the ESC T command to cancel subscript or superscript printing.

SI or ESC SI

Sets compressed printing (IBM/EPSON).

ASCII Code	SI or ESC SI
Hexadecimal Value	X'0F' or X'1B' X'0F'
Decimal Value	15 or 27 15

This command is accepted at any position within the line. The setting of this command depends on the horizontal spacing previously set:

10 CPI → 17 CPI

12 CPI → 20 CPI

Proportional → 1/2 width

The DC2 code cancels the compressed printing.

SO or ESC SO

Sets double width printing (one line) (IBM/EPSON).

ASCII Code	SO or ESC S0
Hexadecimal Value	X'0E' or X'1B' X'0E'
Decimal Value	14 or 27 14

This code causes subsequent data in the same line to be printed as double width characters. It is canceled by the CR, LF, VT, FF and DC4 codes or when the buffer is full.

ESC s

Sets and resets Quiet printing. (EPSON)

ASCII Code	ESC s *n*
Hexadecimal Value	X'1B' X'73' *n*
Decimal Value	27 115 *n*

This command controls print speed as follows:

n	Selection
0	Normal speed printing
1	Quiet speed printing

ESC T

Cancels subscript or superscript printing (IBM/EPSON).

ASCII Code ESC T

Hexadecimal Value X'1B' X'54'

Decimal Value 27 84

This command cancels subscript or superscript printing started with the ESC S command.

ESC W

Sets or cancels double width printing (IBM/EPSON).

ASCII Code ESC W *n*

Hexadecimal Value X'1B' X'57' *n*

Decimal Value 27 87 *n*

Range $0 \le n \le 1$

Enables or disables double width printing. See the following table:

n	Selection
0	Double Width Printing disabled
1	Double Width Printing enabled

ESC w

Sets or cancels double height printing. (EPSON)

ASCII Code ESC w *n*

Hexadecimal Value X'1B' X'77' *n*

Decimal Value 27 119 *n*

Range $0 \le n \le 255$

Enables or disables double-height printing of all characters. The first line of a page is not doubled if the ESC w command is sent on the first line; all following lines are printed at double-height. Double-height printing overrides superscript, subscript, and condensed. Superscript, subscript, and condensed print resumes when double-height printing is canceled. See the following table:

n	Selection
0	Double Height Printing disabled
1	Double Height Printing enabled

ESC x

Selects Letter Quality or Draft. (EPSON)

ASCII Code	ESC x *n*
Hexadecimal Value	X'1B' X'78' *n*
Decimal Value	27 120 *n*

This command selects either LQ or Draft printing according to the following values:

n	Selection
0	Draft printing
1	Letter Quality printing

If you select proportional spacing with the ESC p command during Draft printing, the printer prints an LQ font instead. When you cancel proportional spacing with the ESC p command, the printer returns to Draft printing.

SI

Sets compressed printing. (EPSON)

ASCII Code	SI
Hexadecimal Value	X'0F'
Decimal Value	15

This command is accepted at any position within the line. DC2 code cancels compressed printing. The setting of this command depends on the horizontal spacing previously set

10 CPI → 17 CPI

12 CPI → 20 CPI

Proportional → 1/2 width

DC2 code cancels compressed printing.

SO

Sets double width printing (one line) (IBM/EPSON).

ASCII Code	SO
Hexadecimal Value	X'0E'
Decimal Value	14

This code causes subsequent data in the same line to be printed as double width characters. It is cancelled by the CR, LF, VT, FF and DC4 codes or when the buffer is full.

ESC [T

Selects a Code page (IBM).

ASCII Code ESC [T *4 0 0 0 Hc Lc*

Hexadecimal Value X'1B' X'5B' X'54' *04 00 00 00 Hc Lc*

Decimal Value 27 91 84 *4 0 0 0 Hc Lc*

This sequence allows you to change the current code page. If an unavailable code page is specified, this command is ignored. The digits *04 00 00 00* (hexadecimal) and *4 0 0 0* (decimal) are constant. To calculate Hc Lc for a code page that is not shown: If your code page has an alphabetic character, such as 437G, add 10,000 to the code page number, then divide by 256.

- The whole number result is the Hc value
- The remainder is the Lc value.

Hc	Lc		Hc	Lc		Hc	Lc		Hc	Lc	
1	181	CP437	3	96	CP864	33	143	8859/1	4	229	CP1253
3	122	CP437G	3	97	CP865	33	144	8859/2	4	230	CP1254
33	129	CP437 Slavic	3	98	CP866	33	145	8859/3	4	231	CP1255
33	82	CP850	3	99	CP867	33	146	8859/4	4	232	CP1256
3	83	CP851	3	108	CP876	33	147	8859/5	4	233	CP1257
3	84	CP852	3	109	CP877	33	148	8859/6			
3	85	CP853	4	74	CP1098	33	149	8859/7			
3	87	CP855	33	123	96 GREEK	33	150	8859/8			
3	89	CP857	33	124	GOST	33	151	8859/9			
3	90	CP858	33	125	TASS	3	155	8859/15			
3	92	CP860	33	126	MAZOWIA	4	226	CP1250			
3	94	CP862	33	128	UKRANIAN	4	227	CP1251			
3	95	CP863	33	138	KOI8-U	4	228	CP1252			

ESC \

Prints characters from all characters table. (IBM)

ASCII Code ESC \ n_1 n_2

Hexadecimal Value X'1B' X'5C' n_1 n_2

Decimal Value 27 92 n_1 n_2

Range

$0 \le n_1 \le 255$
$0 \le n_2 \le 255$

This command prints the next $n_1 + n_2$ x 256 characters from the table of all printable characters.

The total number of characters that will be printed from the table of all printable characters is equal to n_1 + (n_2 x 256). For example, to print 300 characters from the table of all printable characters: n_1 = 44, n_2 = 1.

The control codes are not recognized as long as this sequence is active. The space character is printed as an unassigned character.

ESC ^

Prints a single character from the all characters table. (IBM)

ASCII Code	ESC ^ *n*
Hexadecimal Value	X'1B' X'5E' *n*
Decimal Value	27 94 *n*
Range	0 ≤ *n* ≤ 255

This command prints the next character from the all characters table. This sequence prints only one character from the all character table.

ESC 6

Selects the Character Set 2 (IBM).

ASCII Code	ESC 6
Hexadecimal Value	X'1B' X'36'
Decimal Value	27 54

This command selects the character set 2.

ESC 6

Enable Printable Code Area Expansion (EPSON).

ASCII Code	ESC 6
Hexadecimal Value	X'1B' X'36'
Decimal Value	27 54

ESC 7

Selects the Character Set 1 (IBM).

ASCII Code	ESC 7
Hexadecimal Value	X'1B' X'37'
Decimal Value	27 55

This command selects the character set 1.

ESC 7

Cancel Printable Code Area Expansion (EPSON)

ASCII Code	ESC 7
Hexadecimal Value	X'1B' X'37'
Decimal Value	27 55

ESC k

Selects the LQ fonts. (EPSON)

ASCII Code ESC k *n*

Hexadecimal Value X'1B' X'6B' *n*

Decimal Value 27 107 *n*

Selects one of the available fonts in Letter Quality. If Draft mode is selected when this command is sent, the new LQ font is selected when the printer returns to LQ printing.

A boldface font is available if the command ESC p1 (proportional) is sent.

n	Types	*n*	Types
1	Gothic	6	OCR-A
2	Courier	7	Presenter
3	Prestige	11	Boldface proportional
4	Script	12	Block Char.
5	OCR-B		

ESC R

Selects Nation character set. (EPSON)

ASCII Code ESC R *n*

Hexadecimal Value X'1B' X'52' *n*

Decimal Value 27 82 *n*

Range $0 \le n \le 13$

This code causes the national character set to be selected according to the parameter *n*. See the following table:

n	National Character Sets	*n*	National Character Sets
0	USA	8	Japan
1	France	9	Norway
2	Germany	10	Denmark-II
3	United Kingdom	11	Spain-II
4	Denmark-I	12	Latin America
5	Sweden	13	French Canadian
6	Italy	14	Latin America-II
7	Spain-I		

ESC t

Selects characters table. (EPSON)

ASCII Code ESC t *n*

Hexadecimal Value X'1B' X'74' *n*

Decimal Value 27 116 *n*

Range $0 \le n \le 3$

Selects the upper half (from 128 to 255) from the character table.

n	Character Tables
0	Standard Italic Character Set
1	ASCII Character Set
2	Remaps DLL Character Set from position 0-127 to 128-255

Download Character

ESC %

Selects user-defined character set. (EPSON)

ASCII Code ESC & *n*

Hexadecimal Value X'1B' X'25' *n*

Decimal Value 27 37 *n*

This command switches between normal (resident) and user-defined (downloaded) characters:

n	Selection
1	Selects the use of downloaded character set in RAM
0	Selects the use of resident character set in ROM

ESC &

Defines the 24-pin download characters. (EPSON)

ASCII Code ESC & *NUL n m* a_0 a_1 a_2 d_1 ... d_x

Hexadecimal Value X'1B' X'26' *00 n m* a_0 a_1 a_2 d_1 ... d_x

Decimal Value 27 38 *00 n m* a_0 a_1 a_2 d_1 ... d_x

Range

$0 \le n \le 127$
$0 \le m \le 127$
$0 <= d_x <= 255$
a_0 a_1 a_2: see below

This escape sequence is used to download fonts to the printer. Once fonts have been downloaded, they can be selected by ESC % *n*.

Parameter *n* is the character position of the first character and parameter *m* is the character position of the last character to be downloaded. For example, to download character “RST” the user would specify *n*=52H and *m*=54H. Characters must be downloaded to consecutive positions after the first character. The parameters a_0, a_1, and a_2 must be sent for each character being downloaded and are known as the attribute bytes. Parameter a_0 specifies the number of dot columns to be added before the character.

Parameter a_1 specifies the width of the character. Parameter a_2 specifies the number of dot columns to add after the character. The parameters d_1 ... d_x represent the dot column data being downloaded for each character. 2 or 3 data bytes represent 1 column of dots depending upon the print mode type as shown below. Draft, Letter Quality, superscript, and subscript fonts can be downloaded. It is necessary to select the desired print mode prior to sending the download data. Each dot column has a width of 1/120" in Draft and 1/360 in Letter Quality. Following are limits of parameters a_0, a_1, and a_2 for LQ Draft and Super/Subscript print mode at various character pitches.

	LQ					**DRAFT**	
	10 cpi	12 cpi	15 cpi	Prop	Script	Norm	Script
a_1	29	23	15	39	23	9	7
$a_0 + a_1 + a_2$	36	30	24	42	36	12	12

The mapping of data bits to wires is as follows:

BYTE #	BIT #	LQ WIRE #	DRAFT WIRE #	SUBSCRIPT WIRE #	SUBSCRIPT WIRE #
1	7	1	1	1	9
	6	2	2	2	10
	5	3	3	3	11
	4	4	4	4	12
	3	5	5	5	13
	2	6	6	6	14
	1	7	7	7	15
	0	8	8	8	16
2	7	9	9	9	17
	6	10	10	10	18
	5	11	11	11	19
	4	12	12	12	20
	3	13	13	13	21
	2	14	14	14	22
	1	15	15	15	23
	0	16	16	16	24
3	7	17	17	**Note:** Only 2 Bytes are required for superscript/subscript characters.	
	6	18	18		
	5	19	19		
	4	20	20		
	3	21	21		
	2	22	22		
	1	23	23		
	0	24	24		

If a data bit has a value of 1, the corresponding wire is fired. If a data bit has a value of 0, the wire is not fired. In general, the user of this feature must be careful that the number of bytes of downloaded information is equal to 3 x width of the character being defined (a_1) or the results will be unpredictable. Only one print mode type may be downloaded at a time. That is, if draft characters have been downloaded, then selecting Letter Quality and downloading characters will cause the draft download characters to be cleared. This applies similarly to script characters.

ESC :

Copies characters from ROM to RAM. (EPSON)

ASCII Code	ESC : *NUL n 0*
Hexadecimal Value	X'1B' X'3A' *00 n 00*
Decimal Value	*27 58 n 0*

This code copies the character generator in ROM into RAM area dedicated to the user-defined characters. The *n* parameter represents the LQ type style. It copies the data for the characters between 0 and 255 (from the italic character table) of the Courier or Gothic font from ROM to RAM memory according to the following values:

n	Selection	*n*	Selection
2	Courier	1	Gothic
4	Script	5	OCR-B
6	OCR-A		
182	DLL		

Before copying ROM characters to RAM, cancel italics with the ESC 5 command. After copying you can italicize characters by sending the ESC 4 command.

ESC =

Defines downloaded characters. (IBM)

ASCII Code	ESC = *n m id p t*
Hexadecimal Value	X'1B' X'3D' *n m id p t*
Decimal Value	27 61 *n m id p t*

This sequence allows you to design and then down-line load special characters not present in the character set in use. Whenever you would like to start the DLL setting procedure, proceed as follows:

- Copy the character generator in ROM into RAM
- Select the DLL generator

There are 256 entries of 9 bytes that compose the look up table of a character generator. One entry describes one character as follows:

Byte 1, 2 The absolute address of the character definition.

Byte 3 :

Bit 7

1: indicates that the character is a graphic character (connects at 6 lpi)

0: indicates that the character is an alphanumeric character

Bit 6

0: indicates a DLL character

1: indicates a resident character

Bit 5 to 0 These 6 bits indicate the effective number of dot columns of the character shape stored in memory.

Byte 4: Graphic character description:

- *0*: shading character
- *1*: line drawing character
- *10*: underscored character
- *11*: not supported

All graphics characters are 30 dots high. An underscored character is defined as a blank graphic (all zeros) and it is automatically generated by the printer. A shading character repeats dots 1—6 of each column as dots 25 through 30 respectively. A line drawing character repeats dots 23 and 24 as the pairs 25 and 26, 27 and 28, 29 and 30.

Bit 5 to 0 The number of dot columns of the character shape minus one. For example, the character width of Draft generator is 10 dots and bit 5 to 0 must be set to 9.

Bit 5 to 9 — Compression mask description. It is used to optimize the memory occupation and it is based on the concept that a dot column on its left is not stored. You can calculate the compression mask of a character only after designing the entire character. Every bit is associated with a dot column with bit 7 of byte 5 associated with the leftmost column. The bit is set to {1} if the column is equal to the preceding one; otherwise it is set to {0}. If the character is longer than 39 dot columns, the remaining dot columns must be stored without compression. Bit 40 (bit 0 of byte 9) must be 0. If no compression is present in the character, byte 5 to 9 is composed of all zeros.

If you wish to copy an entry over another entry so that two characters with the same characteristics and different code are present in the same look-up table, the DLL sequence ESC = *n m id p t* has the following meaning:

n and *m*: Indicates the byte number of the sequence *n* is the low part and *m* is the high part.

id: Indicates the printer model. The *id* related to your printer is *23H*.

p and *t*: Indicates the memory address of the character that you wish to replace. *p* is the low part and *t* is the high part.

data: Is the entry *9 bytes* of the character that you want to position at address specified by *p* and *t*.

Bit-Image

ESC *

Sets dot graphics printing. (IBM XL24 AGM, EPSON)

ASCII Code: ESC * $m\ n_1\ n_2\ p_1\ p_2 \ldots p_x$

Hexadecimal Value: X'1B' X'2A' $m\ n_1\ n_2\ p_1\ p_2 \ldots p_x$

Decimal Value: 27 42 $m\ n_1\ n_2\ p_1\ p_2 \ldots p_x$

Range

$0 \le n_1 , n_2 \le 255$
$0 \le p_x \le 255$

Selects 8-dot graphic or 24-dot graphic modes according to the table below. The *m* parameter determinates the horizontal density as well as the number of wires to be fired.

For 8-dot images, the total number of data bytes (*p*) to be sent is determined by the following formula: $n_1 + n_2 \times 256$.

m	DPI	# DOTS	DENSITY NAME	Other ESC
0	60	8	Normal density	ESC K
1	120	8	Dual density	ESC L
2	120 (virtual)	8	Double speed, Dual density	ESC Y
3	240 (virtual)	8	Quadruple-density	ESC Z
4	80	8	CTR Graphic I	
6	90	8	CTR Graphic II	

For 24-dot images, the total number of data bytes (*px*) to be sent is determined by the following formula: 3.*x*.(*n*1 + *n*2 *x* 256).

m	DPI	# DOTS	DENSITY NAME
32	60	24	Normal density
33	120	24	Double density
38	90	24	CRT Graphic III
39	180	24	Triple-density
40	360 (virtual)	24	Hex-density

ESC ?

Reassigns dot graphics mode. (EPSON)

ASCII Code ESC ? *n m*

Hexadecimal Value X'1B' X'3F' *n m*

Decimal Value 27 63 *n m*

Reassigns one of the dot graphics mode (described in the command ESC *) to one of the following commands: ESC K, ESC L, ESC Y and ESC Z. The *n* parameter specifies a character (K, L, Y, or Z) which is reassigned to specific mode *m* = 0,1,2,3.

m	*n*	*m*	*n*
0	(K): ESC K graphic command	2	(Y): ESC Y graphic command
1	(L): ESC L graphic command	3	(Z): ESC Z graphic command

ESC K

Normal density dot graphics printing (60 dpi) (IBM/EPSON).

ASCII Code ESC K n_1 n_2 p_1 p_2 ... p_x

Hexadecimal Value X'1B' X'4B' n_1 n_2 p_1 p_2 ... p_x

Decimal Value 27 75 n_1 n_2 p_1 p_2 ... p_x

Range

$0 \le n_1 \le 255$
$0 \le n_2 \le 31$
$0 \le p \le 255$

Terminator code. This command prints dot graphics at 60 horizontal dots per inch (dpi) by 180 vertical dpi.

The parameter values are calculated as follows:

n_1 Remainder of the number of columns divided by 256.

n_2 Integer result of the previous division.

p_1 Sum of the values corresponding to the dots that should be printed in the first column of the graphics pattern.

p_2 Sum of the values corresponding to the dots that should be printed in the second column of the graphics pattern.

p_x Sum of the values corresponding to the dots that should be printed in the last column of the graphics pattern.

ESC L

Double density dot graphics printing (120 dpi) (IBM/EPSON).

ASCII Code	ESC L n_1 n_2 p_1 p_2 ... p_x
Hexadecimal Value	X'1B' X'4C' n_1 n_2 p_1 p_2 ... p_x
Decimal Value	27 76 n_1 n_2 p_1 p_2 ... p_x
Range	$0 \le n_1 \le 255$ $0 \le n_2 \le 31$ $0 \le p \le 255$

Terminator code. This command prints dot graphics at 120 horizontal dpi by 180 vertical dpi.

The parameter values should be calculated as follows:

n_1 Remainder of the number of columns divided by 256.

n_2 Integer result of the previous division.

p_1 Sum of the values corresponding to the dots that should be printed in the first column of the graphics pattern.

p_2 Sum of the values corresponding to the dots that should be printed in the second column of the graphics pattern.

p_x Sum of the values corresponding to the dots that should be printed in the last column of the graphics pattern.

ESC Y

Double density dot graphics printing at double-speed graphics (120 virtual dpi) (IBM/EPSON).

ASCII Code	ESC Y n_1 n_2 p_1 p_2 ... p_x
Hexadecimal Value	X'1B' X'59' n_1 n_2 p_1 p_2 ... p_x
Decimal Value	27 89 n_1 n_2 p_1 p_2 ... p_x
Range	$0 \le n_1 \le 255$ $0 \le n_2 \le 31$ $0 \le p \le 255$

Terminator code. This command prints dot graphics at 120 horizontal dpi by 180 vertical dpi.

The parameter values should be calculated as follows:

n_1 Remainder of the number of columns divided by 256.

n_2 Integer result of the previous division.

p_1 Sum of the values corresponding to the dots that should be printed in the first column of the graphics pattern.

p_2 Sum of the values corresponding to the dots that should be printed in the second column of the graphics pattern.

p_x Sum of the values corresponding to the dots that should be printed in the last column of the graphics pattern.

ESC Z

Quadruple density dot graphics printing (240 virtual dpi) (IBM/EPSON).

ASCII Code ESC Z n_1 n_2 p_1 p_2 ... p_x

Hexadecimal Value X'1B' X'5A' n_1 n_2 p_1 p_2 ... p_x

Decimal Value 27 90 n_1 n_2 p_1 p_2 ... p_x

Range

$0 \le n_1 \le 255$
$0 \le n_2 \le 31$
$0 \le p \le 255$

Terminator code. This command prints dot graphics at 240 horizontal dot per inch by 180 vertical dpi.

The parameter values should be calculated as follows:

n_1 Remainder of the number of columns divided by 256.

n_2 Integer result of the previous division.

p_1 Sum of the values corresponding to the dots that should be printed in the first column of the graphics pattern.

p_2 Sum of the values corresponding to the dots that should be printed in the second column of the graphics pattern.

ESC [g

Selects 8 or 24 needle dot graphics mode. (IBM)

ASCII Code ESC [g *l h m* n_1 ... n_k

Hexadecimal Value X'1B' X'5B' X'67' *l h m* n_1 ... n_k

Decimal Value 27 91 103 *l h m* n_1 ... n_k

This command selects dot graphics in 8 or 24 needle configuration. *h**256+*l* represents the number of data + l. The *m* parameter represents the dot graphics modes as shown in the following table:

m	DENSITY	NEEDLE	FUNCTION
0	60	8	Same as ESC K (8 needles)
1	120	8	Same as ESC L (8 needles)
2	120	8	Same as ESC Y (8 needles)
3	240	8	Same as ESC Z (8 needles)
8	60	24	Same as ESC * (32)
9	120	24	Same as ESC * (33)
11	180	24	Same as ESC * (39)
12	360	24	Same as ESC * (40)

The n_1, n_2 up to n_k parameters are dot graphics data. If you select the 8 needle dot graphics mode, one byte of data is needed for each column so that the formula *h*256+l = number of columns + l* is valid. If you select the 24 needle dot graphics mode, three bytes of data is needed for each column so that the formula *h*256+l = number of columns *3–l* is valid.

Data Input Control

CAN

Cancels line. (EPSON)

ASCII Code	CAN
Hexadecimal Value	X'18'
Decimal Value	24

This code clears all printable characters and bit-image graphics on the current line. This code moves the print position to the left-margin position.

CAN

Cancels data. (IBM)

ASCII Code	CAN
Hexadecimal Value	X'18'
Decimal Value	24

This code clears all data stored in the preceding print buffer but does not change the current print position.

DC1

Selects printer. (IBM)

ASCII Code	DC1
Hexadecimal Value	X'11'
Decimal Value	17

This command causes the printer to be enabled after it has been disabled by the ESC Q command.

DC1

Selects printer. (EPSON)

ASCII Code	DC1
Hexadecimal Value	X'11'
Decimal Value	17

This command causes the printer to be enabled after it has been disabled by the DC3 command.

DC3

Deselects printer. (EPSON)

ASCII Code	DC3
Hexadecimal Value	X'13'
Decimal Value	19

This code deselects the printer. The printer remains deselected until it receives a DC1 command or power is turned off then on again. The printer ignores the ESC @ command (initialize printer) when it is deselected.

DEL

Deletes the last character. (EPSON)

ASCII Code	DEL
Hexadecimal Value	X'7F'
Decimal Value	127

This command causes the printer to delete the last printable character sent to the printer. Printer control codes are not affected. The printer ignores this command if it follows a command that moves the horizontal print position (ESC $, ESC \, or HT).

ESC

Cancels MSB control. (EPSON)

ASCII Code	ESC #
Hexadecimal Value	X'1B' X'23'
Decimal Value	27 35

This command cancels any controls on the Most Significant Bit (MSB) (bit number 7) set by ESC = or ESC > commands. The printer then accepts all MSB data as is.

ESC =

Sets MSB to 0. (EPSON)

ASCII Code	ESC =
Hexadecimal Value	X'1B' X'3D'
Decimal Value	27 61

This command sets the MSB (bit number 7) of all incoming data to 0. All data is affected, including graphics data.

ESC >

Sets MSB to 1. (EPSON)

ASCII Code	ESC >
Hexadecimal Value	X'1B' X'3E'
Decimal Value	27 62

This command sets the MSB (bit number 7) of all incoming data to 1. All data is affected, including graphics data.

ESC Q

Deselects Printer. (IBM)

ASCII Code	ESC Q *n*
Hexadecimal Value	X'1B' X'51' *n*
Decimal Value	27 81 *n*

This sequence tells the printer not to accept data from the host. The host must reset the printer or select the printer by using DC1 (Select Printer) to accept data. To deselect the printer, use ESC Q35.

Miscellaneous

BEL

Buzzer (IBM/EPSON).

ASCII Code	BEL
Hexadecimal Value	X'07'
Decimal Value	7

This code sounds the printer buzzer.

BS

Print and space back one position (IBM/EPSON).

ASCII Code	BS
Hexadecimal Value	X'08'
Decimal Value	8

This code causes printing to be continued from one column to the left of the current carriage position. The printer ignores this command if it would move the print position to the left of the left margin.

ESC @

Initializes the printer. (EPSON)

ASCII Code	ESC @
Hexadecimal Value	X'1B' X'40'
Decimal Value	27 64

This sequence causes the printer:
- To go back to the current printer setup settings
- To cancel any selected print attributes
- To reset the column counter
- To set the horizontal tabulations every 8 columns
- To clear all vertical tabulations

Only the selection of the Draft or Quality printing DLL, and the selected character generator are maintained.

ESC [K

Sets initial conditions. (IBM 2391 + only)

ASCII Code	ESC [K n_1 n_2 *init id*
Hexadecimal Value	X'1B' X'5B' X'4B' n_1 n_2 *init id*
Decimal Value	27 91 75 n_1 n_2 *init id*

This command causes the printer to reset to its initial status:

n_1, n_2	The n_1 and n_2 parameters specify the number of bytes in the escape sequence normally, n_1 = 2 and n_2 = always 0.
init	The *init* parameter specifies which condition the printer should be initialized: normally *init* = 0,1,4,5,254,255.

init	Description
0	Initializes the printer to user-default settings. The download font remains unchanged. If parameters are specified, they overwrite the default settings. If the emulation mode is changed, the download font is initialized. This command only copies data from the selected macro, adds parameter changes, if any, and stores it in working RAM. The data stored in the macro's nonvolatile RAM is not affected.
1	Initializes the printer to user-default settings. The download font is initialized. If parameters are specified, they overwrite the default settings. This command only copies data from the selected macro, adds parameter changes, if any, and stores it in working RAM. The data stored in the macro's nonvolatile RAM is not affected.
4	Initializes the printer to factory settings. The download font remains unchanged. If parameters are specified, they overwrite the default settings. If the emulation mode is changed, the download font is initialized. This command only copies the default settings from ROM, adds parameter changes, if any, and stores it in working RAM. The data stored in the macro's nonvolatile RAM is not affected.
5	Initializes the printer to factory settings. The download font is initialized. If parameters are specified, they overwrite the default settings. This command only copies the default settings from ROM, adds parameter changes, if any, and stores it in working RAM. The data stored in the macro's nonvolatile RAM is not affected.
254	Initializes the printer to user-default settings. The download font is initialized. If parameters are specified, they overwrite the default settings. This command changes the data stored in the selected macro. It copies data from the selected macro, adds parameter changes, if any, and stores it in working RAM and in the selected macro. It also changes the default macro to the value of parm 3.
255	Initializes the printer to default settings. The download font is initialized. If parameters are specified, they overwrite the default settings. This command changes the data stored in the macro's nonvolatile RAM. It copies default settings from ROM, adds parameter changes, if any, and stores it in working RAM and all macros. It also sets the default macro to disable.

id The *id* parameter specifies the printer for which the following parameter bytes are intended. If the ID does not address your printer, the mode bytes that follow are ignored. The ID values are Hex = X'B6', Dec = 182.

parm$_1$ Specifies the following functions:

	Bit	*Not set*	*Set*
7	Discard byte	Process this byte	Ignore this byte
6	Reserved		
5	Alarm	Alarm enabled	Alarm disabled
4	Automatic CR	No CR on vertical movement	CR on vertical movement
3	Automatic LF	No LF after CR	LF after CR
2	Page length	11 inches	12 inches
1	Slashed zero	Zero without slash	Zero with slash
0	Character set	CS1	CS2

parm$_2$ Specifies the following functions:

	Bit	*Not set*	*Set*
7	Discard byte	Process this byte	Ignore this byte
6	Pass over from CP437-CP850	CP437	CP850
5	Reserved		
4	Reserved		
3	Reserved		
2	Reserved		
1	Line length	13.6 inch	8 inch
0	Reserved		

Only the selection of the Draft or Quality printing DLL, and the selected character generator are maintained.

ESC j

Stops printing. (IBM)

ASCII Code ESC j *n*

Hexadecimal Value X'1B' X'6A' *n*

Decimal Value 27 106 *n*

This command stops the printer. The printer goes offline and a BUSY signal is sent to the computer. To place the printer online, press the ON LINE key.

ESC U

Sets printing direction (IBM/Epson).

ASCII Code ESC U *n*

Hexadecimal Value X'1B' X'55' *n*

Decimal Value 27 85 *n*

Selects bidirectional or unidirectional printing according to the parameters below:

n	Direction
0	Bidirectional printing
1	Unidirectional (left to right) printing

Unidirectional printing provides better alignment of vertical lines while bidirectional printing is faster.

ESC [u *n*

Bar Codes selection. (IBM - Epson)

ASCII Code ESC [u *n*

Hexadecimal Value X'1B' X'5B' X'75' *n*

Decimal Value 27 91 117 *n*

This command is recognized only if the Bar Code menu option is set to “Alternate” mode.

n	
0	Exit Bar Code mode
1	Enter Bar Code mode. Subsequent data are barcode data strings as set by ESC [v *n*

ESC [v n m

Sets Barcode parameters. (IBM - Epson)

ASCII Code ESC [*v n m*

Hexadecimal Value X'1B' X'5B' X'76' *n m*

Decimal Value 27 91 118 *n m*

Set barcode parameters according to the table below. Parameter values that are not supported result in the command being ignored.

n	Parameter Description	*m* values	*m* default
0	Barcode style	see below table	4
1	Barcode height	1-120 (1/12" increments)	12
2	Human readable line	0=disable 1=enable	1
3	Narrow bar width	2-225	3
4	Wide bar width	2-225	7
5	Narrow space width	2-225	3
6	Wide space width	2-225	7
7	Intercharacter space width	2-225	3
8	Rotation and HRC font	0.1=no rotation and current font for HRC 2=90 3=180 4=270 and special HRC font	0
9	Horizontal print density	1=120 2=144 3=180 dpi	1
10	Check digit	0=disable 1=enable	0
11	HRC font for rotate barcode	3=OCRA 4=OCRB	3
12	Barcode height	0-240 (1/24" increments)	24

Table 1. Supported Bar Code Styles

m	**Style**
0	Interleaved 2 of 5
1	Bidirectional 2 of 5
2	Matrix 2 of 5
3	Industrial 2 of 5

Table 1. Supported Bar Code Styles (continued)

4	Code 3 of 9 (default)
5	EAN-8
6	EAN-13
7	Code 11
9	Codabar (default start/stop = a/t)
10	Codabar (default start/stop = b/n)
11	Codabar (default start/stop = c/*)
12	Codabar (default start/stop = d/e)
13	UPC-A
14	UPS-E
15	Code 93
16	Code 128 (subset A, B, and C)
17	Code 128 (subset A, B, and C)
18	Code 128 (subset A, B, and C)
19	MSI
20	UPC 2 Supplemental
21	UPC 5 Supplemental
22	EAN 2 Supplemental
23	EAN 5 Supplemental
50	Postnet

Chapter 3. Native Emulation

The printer in the Native Mode supports the following printer commands.

Format Control

DC4 DC4 ESC 1

Sets vertical spacing *n*/180 inch.

ASCII Code	DC4 DC4 ESC 1 *n*
Hexadecimal Value	X'14' X'14' X'1B' X'31' *n*
Decimal Value	20 20 27 49 *n*
Range	0 ≤ *n* ≤ 255

This command sets vertical spacing to *n*/180 inch for subsequent line feeds.

DC4 DC4 ESC 3 1

Sets vertical spacing 12 lines/30 mm.

ASCII Code	DC4 DC4 ESC 3 1
Hexadecimal Value	X'14' X'14' X'1B' X'33' X'31'
Decimal Value	20 20 27 51 49

This command sets vertical spacing to 12 lines per 30 mm.

DC4 DC4 ESC 3 3

Sets vertical spacing to 3 lines/30 mm.

ASCII Code	DC4 DC4 ESC 3 3
Hexadecimal Value	X'14' X'14' X'1B' X'33' X'33'
Decimal Value	20 20 27 51 51

This command sets vertical spacing to 3 lines per 30 mm.

DC4 DC4 ESC 3 4

Sets vertical spacing 4 lines/30 mm.

ASCII Code	DC4 DC4 ESC 3 4
Hexadecimal Value	X'14' X'14' X'1B' X'33' X'34'
Decimal Value	20 20 27 51 52

This command sets vertical spacing to 4 lines per 30 mm.

DC4 DC4 ESC 3 6

Sets vertical spacing 6 lines/30 mm.

ASCII Code	DC4 DC4 ESC 3 6
Hexadecimal Value	X'14' X'14' X'1B' X'33' X'36'
Decimal Value	20 20 27 51 54

This command sets vertical spacing to 6 lines per 30 mm.

DC4 DC4 ESC 3 8

Sets vertical spacing 8 lines/30 mm.

ASCII Code	DC4 DC4 ESC 3 8
Hexadecimal Value	X'14' X'14' X'1B' X'33' X'38'
Decimal Value	20 20 27 51 56

This command sets vertical spacing to 8 lines per 30 mm.

DC4 DC4 ESC A

Sets the horizontal spacing to 15, 17.1, 20, 24 CPI.

ASCII Code	DC4 DC4 ESC A *n*
Hexadecimal Value	X'14' X'14' X'1B' X'41' *n*
Decimal Value	20 20 27 65 *n*

This is terminator code and causes the current contents of the print buffer to be printed. The subsequent characters are printed at the horizontal spacing specified by the *n* parameter.

n	Spacing
4	15 cpi
5	17 cpi
6	20 cpi
7	24 cpi

Native Character Set

DC4 DC4 ESC g

Selects LQ fonts.

ASCII Code	DC4 DC4 ESC g *n*
Hexadecimal Value	X'14' X'14' X'1B' X'67' *n*
Decimal Value	20 20 27 103 *n*
Range	0 ≤ *n* ≤ 255

If down-line loading is selected, the command is stored and activated as soon as the down-line loading is canceled.

Boldface is available if the ESC p1 (proportional) is sent.

n	Types	*n*	Types
1	Gothic	5	OCR-B
2	Courier	6	OCR-A
3	Prestige	7	Presenter
4	Script	11	Boldface proportional
181	Block Char.	182	DLL

The OCR-A and OCR-B print styles are selected by the DC4 DC4 ESC S command.

DC4 DC4 ESC S

Selects character set ISO Character Sets or Code Pages.

ASCII Code	DC4 DC4 ESC S *n*
Hexadecimal Value	X'14' X'14' X'1B' X'53' *n*
Decimal Value	20 20 27 83 *n*

n	Types	*n*	Types
1	ISO 8859/1 Latin 1	137	CP 852 Eastern Europe
2	ISO 8859/2 Latin 2	138	CP 876 OCR-A
3	ISO 8859/3 Latin 3	139	CP 877 OCR-B
4	ISO 8859/4 Latin 4	140	CP 855 Cyrillic
5	ISO 8859/5 Latin/Cyrillic	141	CP 866 Russian
6	ISO 8859/6 Latin/Arabic	142	GOST Cyrillic
7	ISO 8859/7 Latin/Greek	145	CP 437G Greek
8	ISO 8859/8 Latin/Hebrew	146	CP 853 Turkish
9	ISO 8859/9 Latin 5	147	CP 857 Turkish
15	ISO 8859/15 Latin 9	148	CP 867 Turkish
128	CP 437 USA 149 CP	858	Euro PC Multilingual
129	CP 850 Multilingual	199	96 Greek
130	CP 860 Portugal	200	CP 1250

131	CP 863 Canada/France	201	MAZOWIA
132	CP 865 Denmark/Norway	202	CP 1251
133	CP 851 Greek	203	CP 1252
134	CP 862 Hebrew		
135	CP 864 Arab		
136	TASS Cyrillic		

Bar Codes

DC4 DC4 ESC !

Bar Code Selection.

ASCII Code	DC4 DC4 ESC ! *h t f F r o q b s B S i EM*
Hexadecimal Value	X'14' X'14' X'1B' X'21' ! *h t f F r o q b s B S i EM*
Decimal Value	20 20 27 33 ! *h t f F r o q b s B S i EM*

h = Bar Code Height at *n*/6", 1 ≤ *h* ≤ 30

t = Standard Bar Code to use

t	Name	
1	8-digits European Article Numbering	EAN-8
2	13-digits European Article Numbering	EAN-13
3	Universal Product Code Type A	UPC-A
4	Universal Product Code Type E	UPC-E
5	UPC/EAN 2 Digit Supplement	UPC-EAN 2
6	UPC/EAN 5 Digit Supplement	UPC-EAN 5
7, 8, 9	8-digits European Article Numbering	EAN-8
10	General Purpose Bar Code	Code-GP
11	Code 2 of 5 3-BAR (Data Logic)	C25-3BAR
12	Binary Coded Decimal	CODE BCD
13	MSI-Plessey	MSI
14	AIM-USD-8 / Code-11	Code 11
15	AIM-USD-7 / Code-93	Code 93
16	Code 2 of 5 Bidirectional	C25-BID
17	Code 2 of 5 Interleaved	C25-INT
18	Code 2 of 5 Industrial	C25-IND
19	Code 2 of 5 Matrix	C25-MTX
20	Code 3 of 9	Code-39
21	8-digits European Article Numbering	EAN-8
22	Codabar (all types)	CODABAR
23	Code 128	CODE-128
24	USPS-PostNet	POSTNET

f = Readable character printing

f = 1 printing enabled

f = 0 printing disabled

F = Font selection for the printable characters

F	Selection
0	Selected font by r value
1	Default font for text
2	Special font for OCR-A *o* OCR-B bar codes according to the *t* value
3	Special font for OCR-A bar codes
4	Special font for OCR-B bar codes

r = Bar code rotation

r	Selection
0	No rotation
1	Rotation at 0°
2	Rotation at 90°
3	Rotation at 180°
4	Rotation at 270°

o = A check digit is inserted as the last character of the received string according to the bar code

q = The horizontal graphic density of the bar code

q	Selection
0	1/120"
1	1/180"

b = Narrow bar width in *n*/180", 3 < *b* < 18

s = Narrow space width in *n*/180", 3 < *s* < 18

B = Wide bar width in *n*/180", 6 < *B* < 72

S = Wide space width in *n*/180", 6 < *S* < 72

i = Spacing between characters in *n*/180", 3 < *i* < 72

EM = Check sequence terminator

Bar Code Description

EAN-8	DC4 DC4 ESC ! *n 1 p EM*
	The EAN-8 bar code data field must only contain numeric data and must be eight bytes long including the check digit. The EAN-8 character repertoire provides 0 to 9 ASCII numeric figures. *n* indicates the bar code height in units of 1/6 inch and must be in the range 1 to 12. *p* must be NUL (hex. X'00') if no Human Readable Characters are to be printed, and 1 (hex. X'01') if they are to be printed. The range of values for the *n* and *p* parameters can be increased of 32 dec.

EAN-13	DC4 DC4 ESC ! *n 2 p EM*
	The EAN-13 bar code data field must only contain numeric data and must be 13 bytes long including the check digit. The EAN-13 character repertoire provides 0 to 9 ASCII numeric figures. *n* indicates the bar code height in units of 1/6 inch and must be in the range 1 to 12. If you want to print the Human Readable Characters, *p* must have the value 1 (hex. X'01'); otherwise this value must be NUL (hex. X'00'). The range of values for the *n* and *p* parameters can be increased of 32 dec.

UPC-A	DC4 DC4 ESC ! *n 3 p EM*
	The UPC-A bar code data field allows 10 numeric characters plus one system number digit and one check digit at the leftmost and rightmost positions, respectively. The UPC-A character repertoire provides 0 to 9 ASCII numeric figures. *n* indicates the bar code height in units of 1/6 inch and must be in the range 1 to 12. *p* must be NUL (hex. X'00') if no Human Readable Characters are to be printed, and 1 (hex. X'01') if they are to be printed. The range of values for the *n* and *p* parameters can be increased of 32 dec.

UPC-E	DC4 DC4 ESC ! *n 4 p EM*
	If 11-digit strings are received and the *o* check digit field is missing or takes values 0 or 2, question marks are printed in place of the HRC string, when possible. If the *o* field takes a value of 1, the 12^{th} digit is inserted by the printer as a result of the internally available algorithm applied to the received string. If 10-digit strings are received and the *o* check-digit is missing or takes NULL value, question marks are printed in place of HRC string, if possible. If the *o* field takes a value of 1, a default 0 System-Digit is automatically inserted by the printer and the 12^{th} digit is also inserted as result of he internally available algorithm applied to the final string. If the final UPC-A string cannot be compressed to an 8-digits string, or the received System-Digit is different than 0 or 1, question marks are printed in place of the HRC string, if possible. The LEFT and RIGHT delimiters, System-Digit, and the Check-Digit are printed as descending bars to make a field to host a 6-digits HRC string. The System-Digit HRC to the left of the LEFT delimiter (at about the middle of the symbol) when the *f* field is missing or set to 1. In this case, the Check-Digit shows in HRC to the right of the RIGHT delimiter (at about the middle of the symbol), when *o* field takes values 2 or 3. Otherwise it never shows on the HRC string.

UPC-EAN 2	DC4 DC4 ESC ! *n 5 p EM*
	The ADD ON-2 bar code data fields contain numeric data only. Otherwise question marks are printed in place of the HRC string, if possible. If 3-digit strings are received within a DC4 DC4 ESC (... EM control sequence and the *o* check-digit option field is missing or takes NULL value, the symbol encodes the first 2 digits and the 3rd received digit is used as the check digit, even though this may affect its readability. If the *o* field takes a value of 1, the 3rd digit is matched as opposed to the internally generated check-digit. Question marks are printed in place of HRC string when mismatched, if possible. If 2-digit strings are received and *o* check digit field is missing or takes NULL value, question marks are printed in place of the HRC string, when possible. If the *o* field takes a value of 1, the check digit are computed applying the internally available algorithm to the received string in order to properly encode the symbol. If the *f* field is missing or takes a value of 1, the 2-digit HRC string is printed above the Bar/Spaces symbol and its height is part of the overall symbol's height. The check-digit never shows on the HRC string. If the *f* field takes a value of 0, the symbol's encoding prints at full height.

UPC-EAN 5	DC4 DC4 ESC ! *n 6 p EM*
	The ADD ON-5 bar code data field contains numeric data only. Otherwise question marks are printed in place of the HRC string, if possible. If 6-digit strings are received within a DC4 DC4 ESC (... EM control sequence and *o* check-digit option field is missing or takes NULL value, the symbol encodes the first 5 digits and the 6th received digit is used as a check digit, even though this may affect its readability. If the *o* check digit option takes a value of 1, the 6th digit is matched as opposed to the internally generated check digit. Question marks are printed in place of the HRC string when mismatching, if possible. If 5-digit strings are received and the *o* check digit field is missing or takes a NULL value, question marks are printed in place of the HRC string, if possible. If the *o* field takes a value of 1, the check digit is computed applying the internally available algorithm to the received string in order to properly encode the symbol If the *f* field is missing or takes a value of 1, the 5-digit HRC string is printed above the Bar/Spaces symbol and its height is part of the overall symbol's height; the check-digit never shows on the HRC string. If the *f* field takes a value of 0, the symbol's encoding prints at full height.

CODE GP	DC4 DC4 ESC ! *n 10 p EM*
	The CODE-GP bar code allows bar codes to be constructed from the two basic elements (BAR and SPACE) by sending 0,1 digits: digit 0 produces a BAR and digit 1 produces a SPACE. These two elements may be combined in any sequence, giving the possibility of producing bars and spaces of any width that is a multiple of the basic element width. The default bar/spaces width is 1/60" (*q* = 0,1) but these values may be set by the user according to its specific needs. Data fields do not have a defined format length and contain 0,1 data only. Otherwise question marks are printed in place of HRC string, if possible. No Human Readable Interpretation is possible No TEXT STRING below or above the bar/space symbol can be printed. The *f* and *o* fields are ignored.

C25-3BAR	DC4 DC4 ESC ! *n 11 p EM*
	The C25-3BAR bar code data fields do not have a defined format length and contain numeric data only. Otherwise, question marks are printed in place of the HRC string, if possible. If the *o* check digit option field takes a value of 1, an internally generated check digit complying with general 2/5 family algorithm is added to the encoded string. However, it will not show on the required HRC string.

Code BCD	DC4 DC4 ESC ! *n 12 p EM*
	The CODE-BCD bar code data fields do not have a defined format length and contain numeric data only. Otherwise question marks will be printed in place of the HRC string, if possible. No internal check digit algorithm is available for this standard. The *o* field is meaningless.

MSI Plessey	DC4 DC4 ESC ! *n 13 p EM*			
	The MSI bar code data fields do not have a defined format length and must contain numeric data only. Otherwise question marks are printed in place of the HRC string, if possible. To releave the host from calculating the MSI check digits, internal algorithms are provided that are accessible by the host application program, giving the proper supported value to the *o* check-digit option field, according to the following options:			
	0	Print the bar code symbol with no printer-generated check digits		
	1	Print the bar code symbol with IBM Modulus-10 check digit - generated by the printer and put at the end of the numeric string. This is the 2nd check digit. The 1st check digit is IBM Modulus-10 also.	2	Print the bar code symbol with both check digits generated by the printer and put at the end of the data. The 2nd check digit is IBM Modulus-10. The 1st check digit is also IBM Modulus-10.
	3	Print the bar code symbol with both check digits generated by the printer and put it at the end of the data. The 2nd check digit is IBM Modulus-10. The 1st check digit is NCR Modulus-11. If the modulus is 10, it is an error and question marks are printed in place of the HRC string, if possible.	4	Print the bar code symbol with both check digits generated by the printer and put it at the end of the data. The 2nd check digit is IBM Modulus-10. The 1st check digit is IBM Modulus-11. If the modulus is 10, it is an error and question marks are printed in place of the HRC string, if possible.
	5	Print the bar code symbol with both check digits generated by the printer and put it at the end of the data. The 2nd check digit is IBM Modulus-10. The 1st check digit is the complement to 11 of NCR Modulus-11 algorithm applied to the received string, If the modulus is 0 or 1, the check digit is 0.	6	Print the bar code symbol with both check digits generated by the printer and put it at the end of the data. The 2nd check digit is IBM Modulus-10. The 1st check digit is the complement to 11 of IBM Modulus-11 algorithm applied to the received string. If the modulus is 0 or 1, the check digit is 0.
	7	Print the bar code symbol with both check digits generated by the printer and put at the end of the data. The 2nd check digit is IBM Modulus-10. The 1st check digit is the complement to 11 of NCR Modulus-11 algorithm applied to the received string. If the modulus is 0 or 1, it is an error and question marks are printed in place of the HRC string, if possible.	8	Print the bar code symbol with both check digits generated by the printer and put at the end of the data. The 2nd check digit is IBM Modulus-10. The 1st check digit is the complement to 11 of IBM Modulus-11 algorithm applied to the received string. If the modulus is 0 or 1, it is an error and question marks are printed in place of the HRC string, if possible.
	The printer-generated second check digit does not show on the required HRC string.			

Code 11	DC4 DC4 ESC ! *n 14 p EM*
	The CODE-11 bar code fields do not have a defined format length and contain data belonging to the character set listed below: 0 1 2 3 4 5 6 7 8 9 - Otherwise question marks are printed in place of the HRC string, if possible. This barcode type defines a variable WIDE/NARROW ratio. The bar code is printed at 1/180" horizontal and vertical graphical printing resolution to ensure high readability rate. Each digit encoding is separated from the next by a 1/90"—1/60" wide default Intercharacter Gap. CODE-11 has unique a START/STOP character. The printer generates the couple related to each symbol. It is visually interpreted by an OPEN TRIANGLE and will always appear on the HRC string because its size is usually varied to signify the number of check digits being used in the particular symbol: • SMALL open triangle means ONE check-digit • LARGE open triangle means TWO check-digit The *f* field is meaningless and always defaults to the HRC string print.

Code 93	DC4 DC4 ESC ! *n 15 p EM*
	The CODE-93 bar code fields do not have a defined format length and contain data belonging to the standard ASCII character set, including control codes. Since the GS and EM control codes are used, the DC4 DC4 ESC (... EM “Print bar-code” control sequence is part of the supported character set. The host application must SET THE HIGHER-ORDER BIT of the above control codes to allow the printer to distinguish between encodable data and string terminators. The complete ASCII standard character set is encoded using 47 combinations of 9 bar/space narrow elements arranged into 3 variable width bars with their adjacent variable width spaces. Each of the bars in the supported combinations can be 1, 2, or 3 modules wide. The START/STOP character has a 4-module wide bar. CODE-93 directly implements the basic subset as shown below: 0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z- .SPACES $ / + % ($) (%) (/) (+) (as special control characters) # (as unique START/STOP character) The other STANDARD-ASCII codes not presented above are represented by means of a combination of one control character in the above set followed by a symbol in the alphabetical set. The HRC string is printed BELOW the symbol when *f* field is set to 1 without check digits. Non-printable ASCII characters are represented in the “control code” format (for example, CR is ^M, where “control” is represented as DARK-SQUARE symbol).

2 of 5	DC4 DC4 ESC ! *n 16 p EM*
Bidirectional	The BID-25 bar code data fields do not have a defined format length and contain numeric data only. Otherwise, question marks are printed in place of the HRC string, if possible. If the *o* check digit option field takes a value of 1, an internally generated check digit is added to the encoded string that will not show on the required HRC string.

2 of 5	DC4 DC4 ESC ! *n 17 p EM*
Interleaved	The 2/5-INTERLEAVED bar code does not have a defined format length. However, the total sum of the characters must be even. *n* indicates the bar code height and must be in the range 1 to 12. *p* must be NUL (hex. X'00') if no Human Readable Characters are to be printed, and 1 (hex. X'01') if they are to be printed.

2 of 5	DC4 DC4 ESC ! *n 18 p EM*
Industrial	The 2/5 INDUSTRIAL bar code. Data format length is variable and the supported character set only provides ASCII numeric figures 0 to 9. *n* indicates the bar code height in units of 1/6 inch and must be in the range 1 to 12. *p* must be NUL (hex. X'00') if no Human Readable Characters are to be printed, and 1 (hex. X'01') if they are to be printed.

2 of 5	DC4 DC4 ESC ! *n 19 p EM*
	The 2/5 MATRIX bar code. Data format length is variable and the supported character set only provides ASCII numeric figures 0 to 9. *n* indicates the bar code height in units of 1/6 inch and must be in the range 1 to 12. *p* must be NUL (hex. X'00') if no Human Readable Characters are to be printed, and 1 (hex. X'01') if they are to be printed.

Code 39	DC4 DC4 ESC ! *n 20 p EM*
	The CODE 39 bar code. Data format length is variable and must always start and end with an asterisk. It can contain the alphanumeric character listed below: 0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z -. SPACE $ / + % * (as start / stop character) The parameter indicates the bar code height in units of 1/6 inch and must be in the range 1 to 12. The *p* parameter must be NUL (hex. X'00') if no Human Readable Characters are to be printed, and 1 (hex. X'01') if they are to be printed.

CODABAR	DC4 DC4 ESC ! *n 22 p EM*
	The Codabar bar code data fields do not have a defined format length and contain data belonging to the character set listed hereafter: 0 1 2 3 4 5 6 7 8 9 - $: /. + A B C D E N T * a b c d e n t (only as START/STOP characters) The printer allows any combination of START/STOP characters. If the first and last characters of the received string do not belong to the START/STOP characters subset, question marks are printed in place of the HRC string, if possible

CODE 128	DC4 DC4 ESC ! *n 23 p EM*
	The CODE-128 bar code data fields do not have a defined format length and contain data belonging to the standard ASCII character set, including control codes. Since the GS and EM control codes used within the DC4 DC4 ESC (...EM “Print Bar Code” control sequence are part of the supported character set, the host application must SET THE HIGHER-ORDER BIT of the above control codes to allow the printer to distinguish between encodable data and string terminators.

POSTNET	DC4 DC4 ESC ! *n 24 p EM*
	The POSTNET bar code data fields contain only numeric data and do not have a defined format length. POSTNET bar codes have no printed HRC string. The LOW/TALL bars that encode the symbol comply with the U.S.P.S standard regardless of the *p* field value.

DC4 DC4 ESC (GS

Prints bar code symbols.

ASCII Code DC4 DC4 ESC (GS n_1 *data GS* n_2 *data ... EM*

Hexadecimal Value X'14' X'14' X'1B' X'28' X'1D' n_1 *data ... 19*

Decimal Value 20 20 27 40 29 n_1 *data ... 25*

Range

$1 \le n \le 12$
$0 \le p \le 1$

This sequence prints the bar code symbol according to the previous selection. If you want to print more than one bar code symbol of the same type and height, GS *n* defines the distance from the beginning of the line or between two bar code symbols in multiples of 1/60 or 1/90 of an inch, depending upon the selected barcode density (120 or 180 dpi). At the end of the line *EM* must close this command.

Miscellaneous

DC4 DC4 ESC @

Re-initializes the printer.

ASCII Code	DC4 DC4 ESC @
Hexadecimal Value	X'14' X'14' X'1B' X'40'
Decimal Value	20 20 27 64

This command resets the printer mode and clears the buffer of printable data.

DC4 DC4 ESC J

Sets amplification factor.

ASCII Code	DC4 DC4 ESC J *h v*
Hexadecimal Value	X'14' X'14' X'1B' X'4A' *h v*
Decimal Value	20 20 27 74 *h v*

This command sets the required amplification factor to be applied to the current font.

h It is the horizontal amplification factor; the value range is 1 to 4. It is applied to the basic symbols.

v It is the vertical amplification factor; the value range is 1 to 4.

0 values for either the *h* and *v* parameters keep the related current amplification factor unchanged.

The internally available symbol's amplification algorithms support the following character attributes that may be selected by means of the available control sequences within the currently active emulation: double width, double-height, emphasized, double strike, subscript, superscript, italics, proportional, and compressed.

Doublewide and double-high attributes must be lower than 2.

DC4 DC4 ESC N

Selects/loads or parks the fanfold from the Front 2 path.

ASCII Code	DC4 DC4 ESC N *n*
Hexadecimal Value	X'14' X'14' X'1B' X'4E' *n*
Decimal Value	20 20 27 78 *n*
Range	0 ≤ *n* ≤ 1

n	Selection
0	Selects and loads the fanfold from the Front2 path. If the paper is present, the printer automatically parks the fanfold that is not requested before loading the new one (after having pressed the PARK key in response to the TEAR IF NECESS/PARK PAPER message).
1	Parks the fanfold loaded from the Front2 path to allow the tear off function (after having pressed the PARK key in response to the TEAR IF NECESS/PARK PAPER message).

DC4 DC4 ESC p

Sets quality printing.

ASCII Code	DC4 DC4 ESC p *n*

Hexadecimal Value X'14' X'14' X'1B' X'70' *n*

Decimal Value 20 20 27 112 *n*

n	Selection
1	Best Draft
2	Normal Draft
3	NLQ
4	LQ
5	DLL

DC4 DC4 ESC R

String rotation.

ASCII Code DC4 DC4 ESC R *n string EM*

Hexadecimal Value X'14' X'14' X'1B' X'52' *n string EM*

Decimal Value 20 20 27 82 *n string EM*

n	Selection
0	No rotation.
1	Rotation at 0°
2	Rotation at 90°
3	Rotation at 180°
4	Rotation at 270°

DC4 DC4 ESC r

Digit rotation.

ASCII Code DC4 DC4 ESC r

Hexadecimal Value X'14' X'14' X'1B' X'72'

Decimal Value 20 20 27 144

This command is used to set the required character rotation to be applied to the selected font.

n	Selection
0	No rotation.
1	Rotation at 0°
2	Rotation at 90°
3	Rotation at 180°
4	Rotation at 270°

DC4 DC4 ESC T

Selects/loads or parks the fanfold from the Front1 path.

ASCII Code DC4 DC4 ESC T *n*

Hexadecimal Value X'14' X'14' X'1B' X'54' *n*

Decimal Value 20 20 27 84 *n*

Range 0 ≤ *n* ≤ 1

n	Selection
0	Selects and loads the fanfold from the Front1 path. If the paper is present (cut sheet/fanfold), the printer automatically parks this fanfold that is not requested before loading the new one (after having pressed the PARK key in response to the TEAR IF NECESS/PARK PAPER message).
1	Parks the fanfold loaded from the Front1 path to allow the tear off function (after having pressed the PARK key in response to the TEAR IF NECESS/PARK PAPER message).

DC4 DC4 ESC Y

Selects emulation.

ASCII Code DC4 DC4 ESC Y *n*

Hexadecimal Value X'14' X'14' X'1B' X'59' *n*

Decimal Value 20 20 27 89 *n*

Selects the printer emulation type according to the *n* parameter value:

n	Emulation
0	Default printer emulation
1	EPSON LQ Series
2	IBM Proprinter XL 24
4	IBM Proprinter XL 24 AGM
5	IBM 2391+

DC4 DC4 ESC Z

Makes AGA in column.

ASCII Code DC4 DC4 ESC Z *n*

Hexadecimal Value X'14' X'14' X'1B' X'5A' *n*

Decimal Value 20 20 27 90 *n*

The *n* parameter is the column number at 10 cpi where the AGA (Automatic Gap Adjustment) is made.

DC4 DC4 ESC u

Selects the user macros.

ASCII Code DC4 DC4 ESC u *n*

Hexadecimal Value X'14' X'14' X'1B' X'75' *n*

Decimal Value 20 20 27 117 *n*

Range 0 ≤ *n* ≤ 4

n	Selection
1	Selects User Macro 1
2	Selects User Macro 2
4	Selects User Macro 3

5	Selects User Macro 4

DC4 DC4 ESC v

Selects graphics print speed.

ASCII Code DC4 DC4 ESC v *n*

Hexadecimal Value X'14' X'14' X'1B' X'76' *n*

Decimal Value 20 20 27 118 *n*

n	Selection
0	Selects graphics print at low speed
1	Selects graphics print at high speed

DC4 DC4 ESC D

Sends the operator panel messages to the serial I/F.

ASCII Code DC4 DC4 ESC D *n*

Hexadecimal Value X'14' X'14' X'1B' X'44' *n*

Decimal Value 20 20 27 68 *n*

This command enables or disables sending operator panel messages to the serial I/F. The string to send is the following: *STX "message (16 ASCII byte-characters)"EXT*.

n	Selection
0	enabled
1	disabled

DC4 DC4 ESC v

Selects graphics print speed.

ASCII Code DC4 DC4 ESC v *n*

Hexadecimal Value X'14' X'14' X'1B' X'76' *n*

Decimal Value 20 20 27 118 *n*

n	Selection
0	Selects graphics printing at high vertical density (180 dpi) - reduced print speed.
1	Selects graphics printing at low vertical density (90 dpi) - high print speed.

Chapter 4. ANSI Emulation Commands

The following printer commands are supported by this printer according to the ANSI X3.64 emulation.

Most dimensional parameters in ANSI protocol are expressed in “decipoints”. For example:

1 decipoint = 1/720 inch
72 decipoints = 1/10 inch
120 decipoints = 1/6 inch
720 decipoints = 1 inch
2880 decipoints = 4 inches

All parameter values must be expressed as ASCII numeric rather than binary values.

Parameters, within commands with multiple parameters, must be separated by a semicolon “;”.

See *“Basic Program Sample” on page 86* and result printed by the printer.

Character Set Control

ESC [p_1 x

Selects national character set (Select National Characters - SNC).

ASCII Code	ESC [p_1 x
Hexadecimal Value	X'1B' X'5B' p_1 X'78'
Decimal Value	27 91 p_1 120

This command selects the national character set table according to the p_1 parameter value. See the following tables:

Table 2. 7-bit Substitution

p_1	NATION	p_1	NATION
0	USA	13	Swedish/Finnish A
1	Germany	14	Swedish/Finnish B
2	French A	15	Swedish/Finnish C
3	French B	16	Swedish/Finnish D
4	French Canadian	17	Switzerland
5	Netherlands	18	USA (ISO)
6	Italian	19	Yugoslavia
7	United Kingdom	20	United Kingdom A
8	Spanish	21	Turkey
9	Danish/Norwegian A	22	Greece
10	Danish/Norwegian B	90 to 99	Downloaded Substitution Sets (all fonts)
11	Danish/Norwegian C	25	Cyrillic
12	Danish/Norwegian D		

See the tables in "ANSI National Variations" on page 102.

Table 3. 8-bit Substitution

p_1	CHARACTER SETS	p_1	CHARACTER SETS
437	Code Page 437	8579	Kamenicky
850	Code Page 850	8580	CWI
851	Code Page 851	8581	Roman-8
852	Code Page 852	8582	IN2
853	Code Page 853	8583	Code Page 864E
855	Code Page 855	8584 to 8590	Reserved
858	Code Page 858 (*Euro symbol included*)	8591	ISO 8859-1 Western Europe
860	Code Page 860	8592	ISO 8859-2 Eastern Europe
863	Code Page 863	8593	ISO 8859-3 Southern Europe
864	Code Page 864	8594	ISO 8859-4 Northern Europe
865	Code Page 865	8595	ISO 8859-5 Cyrillic
866	Code Page 866	8596	ISO 8859-6 Arabic
867	Code Page 867	8597	ISO 8859-7 Greek
1250	Code Page 1250	8598	ISO 8859-8 Hebrew
5915	ISO 8859-15 (*Euro symbol included*)	8599	ISO 8859-9 Southern Europe 2
8570 to 8575	Reserved	8600 to 8700	Reserved for other ISO Tables
8576	Mazowia		
8577	Turkish		
8578	Greek		

See the tables in "Character Sets" on page 97.

Character Pitch and Print Modes

ESC [p_1; ... p_n m

Select graphics rendition (SGR).

ASCII Code	ESC [p_1; ... p_n m
Hexadecimal Value	X'1B' X'5B' p_1 X'3B' ... p_n X'6D'
Decimal Value	27 91 p_1 59 ... p_n 109

This command selects fonts, pitch, print modes, and character styles according to the parameter settings:

p	**DEFINITION**
0	Normal Print Mode
1	Bold Print Mode
2	Subscript Mode
3	Superscript Mode
4	Underline Mode
5	Expanded Mode
6	Proportional
7	Italic Mode
8, 9	Reserved
10	Draft Font
11	Draft Font
12	LQ Gothic
13	Draft Font
14	LQ Courier
15	Draft Italic
16	LQ Gothic Italic
17	Draft Italic
18	LQ Courier Italic
19	Draft
20	Reserved
21	Double Underline Mode
22	Cancel Bold Mode
23	Reserved
24	Cancel Underline Mode (Single & Double)
25	Cancel Expanded Mode
26	Cancel Proportional Mode
30	Select black (all ribbons)
60	High speed draft at 10 cpi
61	LQ Courier at 10 cpi
62	LQ Prestige at 10 cpi
63	LQ Script at 10 cpi
64	LQ OCR-A at 10 cpi
65	LQ OCR-B at 10 cpi
66	LQ Courier at 10 cpi
67	LQ Courier at 10 cpi
68	LQ Courier at 10 cpi
70	LQ Courier at 10 cpi
71	LQ Courier at 10 cpi
72	LQ Courier at 10 cpi
73	LQ Courier at 10 cpi

Subscript and Superscript modes are enabled through the *System Menu* (`ANSI OPTIONS-S/SCRIPT YES`). Refer to the *User Manual*.

ESC [p_1; p_2 SP B

Graphic size modification (GSM).

ASCII Code	ESC [p_1; p_2 SP B
Hexadecimal Value	X'1B' X'5B' p_1 X'3B' p_2 X'20' X'42'
Decimal Value	27 91 p_1 59 p_2 32 66

This command sets the height and/or width of expanded and oversized characters.

The p_1 and p_2 parameters are the percentages by which the height and width will be multiplied, respectively. The default values of p_1 and p_2 are 100%.

ESC [p_1 t

Special print mode (Oversize/Expanded/Bar code Mode - SPM).

ASCII Code	ESC [p_1 t
Hexadecimal Value	X'1B' X'5B' p_1 X'74'
Decimal Value	27 91 p_1 116

This sequence selects or deselects oversize expanded or bar code mode according to the p_1 parameter value. See the following table:

p_1	**FUNCTION**
0	Cancel special mode
1	Select oversize mode
2	Select expanded mode
3	Select bar code mode

It can select just one special print mode at a time.

SO

Shift out.

ASCII Code	SO
Hexadecimal Value	X'0E'
Decimal Value	14

This code enables Expanded/Oversize mode as determined by the last received ESC [p_1 t command.

SI

Shift in.

ASCII Code	SI
Hexadecimal Value	X'0F'
Decimal Value	15

This code disables Expanded/Oversize mode as determined by the last received ESC [p_1 t command.

ESC [p_1; p_n {

Unidirectional printing (UDP).

ASCII Code	ESC [p_1; p_n {
Hexadecimal Value	X'1B' X'5B' p_1 X'3B' p_n X'7B'
Decimal Value	27 91 p_1 59 p_n 123

This command selects the unidirectional or bidirectional printing according to the *p* parameter values. See the following table:

p	**FUNCTION**
0	Cancel unidirectional printing
1	Print unidirectional LQ and DP
2	Print unidirectional Dot Graphics

Horizontal Movements

BS

Back space.

ASCII Code	BS
Hexadecimal Value	X'08'
Decimal Value	8

The BS code moves the print head one character to the left at the current cpi.

CR

Carriage return.

ASCII Code	CR
Hexadecimal Value	X'0D'
Decimal Value	13

This code causes the print head to be moved to the left margin on the current line.

SP

Space.

ASCII Code	SP
Hexadecimal Value	X'20'
Decimal Value	32

This code positions one character space to the right of the print position.

ESC [p_1 '

Horizontal position absolute (HPA).

ASCII Code	ESC [p_1 '
Hexadecimal Value	X'1B' X'5B' p_1 X'60'
Decimal Value	27 91 p_1 96

This command causes the print position to be moved to the decipoint location specified by p_1. This sequence can be used to print within the left, top, and bottom margins.

ESC [p_1 a

Horizontal position relative (HPR).

ASCII Code	ESC [p_1 a
Hexadecimal Value	X'1B' X'5B' p_1 X'61'
Decimal Value	27 91 p_1 97

This command moves the print position to the right, relative to the current position. The p_1 parameter specifies the number of decipoints. This command cannot be used to move beyond the right margin.

ESC [p_1; p_2 s

Left/right margin set (SLR).

ASCII Code	ESC [p_1; p_2 s
Hexadecimal Value	X'1B' X'5B' p_1 X'3B' p_2 X'73'
Decimal Value	27 91 p_1 59 p_2 115

This command sets the left and right margin values. The p_1 parameter specifies the decipoint value of the left margin. The p_2 parameter specifies the decipoint value of the right margin value. The default value for the left margin is 0. The value for the right margin is the maximum width supported by the printer configuration (that is 13.6*720=9792).

ESC [p_1 j

Horizontal position backward (HPB).

ASCII Code	ESC [p_1 j
Hexadecimal Value	X'1B' X'5B' p_1 X'6A'
Decimal Value	27 91 p_1 106

This command causes the current horizontal position to be moved backwards as specified by the p_1 parameter (decipoints).

HT

Horizontal tab.

ASCII Code	HT
Hexadecimal Value	X'09'
Decimal Value	9

This code causes the print head to be moved to the next tab stop.

ESC H or HTS

Horizontal tab setting.

ASCII Code	ESC H or HTS
Hexadecimal Value	X'1B' X'48' (7-bit) or X'88' (8-bit)
Decimal Value	27 72 (7-bit) or 136 (8-bit)

This command causes a horizontal tab stop to be set to the decipoint value of the current print position.

ESC [p_1; p_n u

Sets horizontal tab stops at specified positions multiple horizontal tab set (HTS).

ASCII Code	ESC [p_1; p_n u
Hexadecimal Value	X'1B' X'5B' p_1 X'3B' p_n X'75'
Decimal Value	27 91 p_1 59 p_n 117

This command sets up to 22 horizontal tab stops at each decipoint position specified by *p* parameters. When specifying more than one position, enter the parameters in ascending order.

Vertical Movements

LF

Line feed.

ASCII Code	LF
Hexadecimal Value	X'0A'
Decimal Value	10

This code positions the paper one line space as indicated by the current line spacing value.

ESC D or IND

Index.

ASCII Code	ESC D or IND
Hexadecimal Value	X'1B' X'44' (7-bit) or X'84' (8-bit)
Decimal Value	27 68 (7-bit) or 132 (8-bit)

This command causes the paper to be positioned down one line space as indicated by the current line spacing value.

ESC E or NEL

Next line.

ASCII Code	ESC E or NEL
Hexadecimal Value	X'1B' X'45' (7-bit) or X'85' (8-bit)
Decimal Value	27 69 (7-bit) or 133 (8-bit)

This command causes the paper to be positioned down one line space as indicated by the current line spacing value. The column counter is reset to the left margin value.

ESC K or PLD

Partial line down.

ASCII Code	ESC K or PLD
Hexadecimal Value	X'1B' X'4B' (7-bit) or X'8B' (8-bit)
Decimal Value	27 75 (7-bit) or 139 (8-bit)

This command causes the paper to be positioned down one half line space at the current line spacing value. This can create an appearance of subscripting. This sequence is also used after an ESC L (partial line up sequence) to recover the original active vertical position.

ESC L or PLU

Partial line up.

ASCII Code	ESC L or PLU
Hexadecimal Value	X'1B' X'4C' (7-bit) or X'8C' (8-bit)
Decimal Value	27 76 (7-bit) or 140 (8-bit)

This command causes the paper to be positioned up one half line space at the current line spacing value. This can create an appearance of superscripting. This sequence is also used after an ESC K (partial line down sequence) to recover the original active vertical position.

ESC M or RI

Reverse index.

ASCII Code	ESC M or RI
Hexadecimal Value	X'1B' X'4D' (7-bit) or X'8D' (8-bit)
Decimal Value	27 77 (7-bit) or 141 (8-bit)

This command causes the paper to be positioned up one line space at the current line spacing value.

ESC [p_1 d

Vertical position absolute (VPA).

ASCII Code	ESC [p_1 d
Hexadecimal Value	X'1B' X'5B' p_1 X'64'
Decimal Value	27 91 p_1 100

This command causes the current vertical position to be set to the decipoint value specified by the p_1 parameter relative to the top most line of the current form length. This sequence can be used to print within the top and the bottom margins.

ESC [p_1 e

Vertical position relative (VPR).

ASCII Code	ESC [p_1 e
Hexadecimal Value	X'1B' X'5B' p_1 X'65'
Decimal Value	27 91 p_1 101

This command causes the current vertical position to be advanced to the position specified by the p_1 parameter (in decipoints) relative to the current print line position.

ESC [p_1; p_2 f

Horizontal and vertical position absolute (HVP).

ASCII Code	ESC [p_1; p_2 f
Hexadecimal Value	X'1B' X'5B' p_1 X'3B' p_2 X'66'
Decimal Value	27 91 p_1 59 p_2 102

This command causes the current print position to be moved to the vertical (p_1) and horizontal (p_2) decipoint locations specified relative to the top left corner of the page.

This sequence can be used to print within the right, left, top and bottom margins.

ESC [p_1 k

Vertical position backward (VPB).

ASCII Code	ESC [p_1 k
Hexadecimal Value	X'1B' X'5B' p_1 X'6B'
Decimal Value	27 91 p_1 107

This command causes the current vertical position to be moved backwards as specified by the p_1 parameter (decipoints) relative to the current print line position.

ESC [p_1; p_n g

Tab clear (TBC).

ASCII Code	ESC [p_1; p_n g
Hexadecimal Value	X'1B' X'5B' p_1 X'3B' p_n X'67'
Decimal Value	27 91 p_1 59 p_n 103

This command clears horizontal and vertical tab stops. If no parameter is present, the horizontal tab stop at the current position is cleared (default).

p	**DESCRIPTION**
0 (default)	Clear horizontal tab at current position
1	Clear vertical tab at current position
3	Clear all horizontal tab stops
4	Clear all vertical tab stops

VT

Vertical tab.

ASCII Code	VT
Hexadecimal Value	X'0B'
Decimal Value	11

This code causes printing to be moved to the left margin at the next vertical tab stop.

ESC J or VTS

Vertical tab setting.

ASCII Code	ESC J or VTS
Hexadecimal Value	X'1B' X'4A' (7-bit) or X'8A' (8-bit)
Decimal Value	27 74 (7-bit) or 138 (8-bit)

This command causes a vertical tab stop to be set to the decipoint value of the current vertical position.

ESC [p_1; p_n v

Sets vertical tab stops at specified positions (Multiple Vertical Tab Set - VTS).

ASCII Code	ESC [p_1; p_n v
Hexadecimal Value	X'1B' X'5B' p_1 X'3B' p_n X'76'
Decimal Value	27 91 p_1 59 p_n 118

This command sets up to 12 vertical tab stops at each decipoint position specified by *p* parameters. The tab stops are measured from the top of the page. When specifying more than one position, enter the parameters in ascending order.

FF

Form feed.

ASCII Code	FF
Hexadecimal Value	X'0C'
Decimal Value	12

This code causes the data in the print buffer to be printed out and then advances the paper to the top of the next form.

ESC [p_1; p_2; p_3 r

Form definition (FD).

ASCII Code	ESC [p_1; p_2; p_3 r
Hexadecimal Value	X'1B' X'5B' p_1 X'3B' p_2 X'3B' p_3 X'72'
Decimal Value	27 91 p_1 59 p_2 59 p_3 114

This command sets the page length, top and bottom margins.

The p_1, p_2 and p_3 parameters specify the decipoint values.

p_n	**FUNCTION**
p_1	Page Length
p_2	Top Margin Position From the Beginning of the Page
p_3	Bottom Margin Position From the End of the Page

The maximum page length value is 15840 decipoints (22 inches).

ESC [p_1; p_2 <SP> G

Sets the line/character spacing.

ASCII Code	ESC [p_1; p_2 <SP> G
Hexadecimal Value	X'1B' X'5B' p_1 X'3B' p_2 X'20' X'47'
Decimal Value	27 91 p_1 59 p_2 32 71

This command sets the spacing between lines (p_1 parameter) and the horizontal character pitch (p_2 parameter) in decipoints.

If the vertical spacing value exceeds the current form length, this setting is ignored.

Interface Control

NUL

Ignored.

ASCII Code	NUL
Hexadecimal Value	NUL
Decimal Value	
	This code is ignored.

ENQ

Enquiry.

ASCII Code	ENQ
Hexadecimal Value	X'05'
Decimal Value	5

This code is used to request the message string defined by the OSC command when parameter p_1=8 is transmitted to the host.

DC1

Selects printer (Data Control 1).

ASCII Code	DC1
Hexadecimal Value	X'11'
Decimal Value	17

In parallel interface, this code reselects the printer after the printer has been deselected by a DC3 code.

In serial interface, this code is sent from the printer to the host to indicate that the printer is ready to receive data.

DC3

Deselects printer (Data Control 3).

ASCII Code	DC3
Hexadecimal Value	X'13'
Decimal Value	19

In parallel interface, this code causes the printer to enter the standby condition until a DC1 code is received.

In serial interface, this code is sent from the printer to the host to indicate that it is not ready to receive data.

Operating System Control

BEL

Bell.

ASCII Code	BEL
Hexadecimal Value	X'07'
Decimal Value	7

This code causes the buzzer to sound for about 0.5 second.

DEL

Delete.

ASCII Code	DEL
Hexadecimal Value	X'7F'
Decimal Value	127

In parallel interface, this code causes the last received character to be deleted.

ESC

Escape.

ASCII Code	ESC
Hexadecimal Value	X'1B'
Decimal Value	27

This code is used as an escape sequence introducer.

ESC \ or ST

String terminator.

ASCII Code	ESC \ or ST
Hexadecimal Value	X'1B' X'5C' (7-bit) or X'9C' (8-bit)
Decimal Value	27 92 (7-bit) or 156 (8-bit)

This command closes the other escape sequences including the operating system and dot graphics commands.

ESC Q or PU1

Executes Selftest.

ASCII Code	ESC Q or PU1
Hexadecimal Value	X'1B' X'51' (7-bit) or X'91' (8-bit)
Decimal Value	27 81 (7-bit) or 145 (8-bit)

In serial interface, upon receipt of this command the printer transmits 1B 50 30 1B 5C.

ESC c

Resets to initial state (RIS).

ASCII Code	ESC c
Hexadecimal Value	X'1B' X'63'
Decimal Value	27 99

This command writes the printer parameters from the stored format assigned to the current path into the current format.

ESC k

Prints test character (PTC).

ASCII Code	ESC k
Hexadecimal Value	X'1B' X'6B'
Decimal Value	27 107

This sequence causes one line of the print head test character to be printed.

ESC [p_1; ... p_n h

Sets mode (SM).

ASCII Code	ESC [p_1; ... p_n h
Hexadecimal Value	X'1B' X'5B' p_1 X'3B' ... p_n X'68'
Decimal Value	27 91 p_1 59 ... p_n 104

This command sets a specific print mode according to the parameter value. If the first parameter (p_1) is preceded by a “>” symbol then all parameters are interpreted as proprietary defined parameters. If the “>” character is not specified, all parameters are interpreted as ANSI defined parameters.

The proprietary defined parameter values are:

p	MNEMONIC MODE	FUNCTION
1	PRM0	Proportional Print Mode
3	CSI	Single Character CSI Mode
4	BLD	Bold Mode
5	CS2	Character Set 2 Mode

The ANSI defined parameter values are:

p	MNEMONIC MODE	FUNCTION
0		Ignored
20	LNM	Auto CR on LF

ESC p_1; p_n l

Resets mode (RM).

ASCII Code ESC p_1; p_n l

Hexadecimal Value X'1B' X'5B' p_1 X'3B' p_n X'6C'

Decimal Value 27 91 p_1 59 p_n 108

This sequence resets the print mode(s) indicated by the *p*1/*pn* parameter(s).

ESC [p_1; p_2 SP~

Selects emulation (EMU).

ASCII Code ESC [p_1; p_2 SP~

Hexadecimal Value X'1B' X'5B' p_1 X'3B' p_2 X'20' X'7E'

Decimal Value 27 91 p_1 59 p_2 32 126

This sequence selects the emulation according to *p* values. The p_1 parameter is an emulation identifier value while p_2 is a reset control value.

The proprietary defined parameter values are:

p_1	p_2	FUNCTION
0		ANSI
1 - 20		Reserved
21		IBM Proprinter XL 24/24E
22		EPSON LQ 1050
	0	Hold values (default). The current settings remain valid after changing the printer emulation.
	1	Full reset. The status of such parameters reverts to defaults dependent on the selected emulation.

To select ANSI mode from the Proprinter XL 24 mode and maintain the parameters, the sequence would be: <ESC>[0; 0<SP>~ Leading zeros and defaulting parameters are not guaranteed to be parsed and therefore should not be used by the application. Parameter p_1 & p_2 will be expressed as ASCII, not binary, values. In the example above, “0” is “30H”, not “00H”.

Graphics Control Functions

ESC [p_1 q

Select graphics mode/density (GRM).

ASCII Code	ESC [p_1 q
Hexadecimal Value	X'1B' X'5B' p_1 X'71'
Decimal Value	27 91 p_1 113

This command selects the density of the graphics mode.

p	DPI (Horizontal)		Image	dpi vertical	#bytes/dot-column
	AGM=N	AGM=Y			
0	72	60	real	72	1 (6-bit mode)
1	144	120	real	72	1 (6-bit mode)
3	216	180	real	72	1 (6-bit mode)
10	180	180	real	180	4 (24-bit mode)
11	360	360	virtual	180	4 (24-bit mode)

If ASF has not been selected (*n*=15/16/17 or via operator panel), then *n*=1—4 is ignored. The appropriate path option must be selected from the *System Menu* in order for the sheet feeder to work.

ESC P data

Enter dot graphics mode (Device Control String).

ASCII Code	ESC P data
Hexadecimal Value	X'1B' X'50' data
Decimal Value	27 80

This command enables the dot graphics mode. The density is selected according to the GRM command.

The line spacing value automatically changes if 72-dpi resolution (6-bit mode) is active.

The line spacing value for 180-dpi resolution (24-bit mode) must be selected prior to entering graphics mode.

In 6-bit mode, only 6 bits of a data byte are required to determine which wires are fired. Therefore, only one byte is required for each graphics dot column.

In 24-bit mode, 24 bits of four data bytes are required to determine which wires are fired. Only 6 bits of each byte are used. Therefore, four bytes are required for each graphics dot column.

Table 4. 6-bit mapping

PRINT HEAD WIRE				6 BITS IN 1 BYTE DATA BIT
1	2	&	3	0
3	4	&	5	1
6	7	&	8	2
8	9	&	10	3
11	12	&	13	4
13	14	&	15	5

Since bits 6 & 7 are ignored, wires 16-24 are not used. The state (0 or 1) of bits 6 and 7 must be conditioned so as to make the entire byte fall within the range 20H through 7EH.

Table 5. 24-bit mapping

BYTE	PRINT HEAD WIRE	24 BITS IN 1 BYTE DATA BIT
1	1	0
	2	1
	3	2
	4	3
	5	4
	6	5
2	7	0
	8	1
	9	2
	10	3
	11	4
	12	5
3	13	0
	14	1
	15	2
	16	3
	17	4
	18	5
4	19	0
	20	1
	21	2
	22	3
	23	4
	24	5

ESC [p_1; p_n }

Sets bar code parameters (BC).

ASCII Code	ESC [p_1; p_n }
Hexadecimal Value	X'1B' X'5B' p_1 X'3B' p_n X'7D'
Decimal Value	27 91 p_1 59 p_n 125

This command allows selection of the bar code characteristics such as style height, symbol rotation and so on. The command ESC [3 t enables the bar code mode while ESC [0 t disables the mode.

p_1: Bar code style

p_1	FUNCTION
0	Interleaved 2 of 5
1	Bidirectional 2 of 5
2	Matrix 2 of 5
3	Industrial 2 of 5
4	Code 3 of 9 (default)
5	EAN-8
6	EAN-13
7	Code 11
9	Codabar (default start/stop = a/t)
10	Codabar (default start/stop = b/n)
11	Codabar (default start/stop = c/*)
12	Codabar (default start/stop = d/e)
13	UPC-A
14	UPC-E
15	Code 93
16	Code 128 (subset A, B and C)
17	Code 128 (subset A, B and C)
18	Code 128 (subset A, B and C)
19	MSI
20	UPC 2 Supplemental
21	UPC 5 Supplemental
22	EAN 2 Supplemental
23	EAN 5 Supplemental
50	Postnet

p_2: Barcode Height

p_2	FUNCTION
1	Minimum bar code height (1/12 inch)
120	Maximum bar code height (10 inches)
12	Default bar code height (1 inch)

p_3: Human Readable Input (HRI)

p_3	FUNCTION
0	Disables printing of the HRI
1	Enables printing of the HRI (default)

p_4: Narrow Bar

Default width value: 2 (120, 144 and 180 dpi)

p_5: Wide Bar Width

Default width value: 3 (120, 144 dpi), 4 (180 dpi)

p_6: Narrow Space Width

Default width value: 6 (120, 144 and 180 dpi)

p_7: Wide Space Width

Default width value: 7 (120, 144 dpi), 8 (180 dpi)

p_8: Intercharacter Space Width

Default width value: 3 (120, 144 dpi), 4 (180 dpi)

p_9: Rotation

p_9	FUNCTION
0	0 degrees using current font
1	0 degrees using special HRI font
2	90 degrees using special HRI font
3	180 degrees using special HRI font
4	270 degrees using special HRI font

p_{10}: Horizontal Print Density for Bar Codes Printed

p_{10}	FUNCTION
1	120 dpi horizontal density
2	144 dpi horizontal density (Reserved)
3	180 dpi horizontal density

p_{11}: Check Digit

p_{11}	FUNCTION
0	No check digit requested (default)
1	Check digit requested

p_{12}: Human Readable Font - Reserved

p_{13}: Bar Code Height (in 1/24th-inch increments) - Reserved

Basic Program Sample

```
100     DEFSTR      E:ESC=CHRS(27) 'Define Escape character
110     WIDTH       "LPT1:*,255
120     LPRINT      "FOLLOWING ARE SOME OF THIS PRINTER'S ";
121     LPRINT      "FEATURES USING THE ANSI EMULATION"
130     LPRINT      ESC;"[;72 C";"10 CPI (PICA)"
140     LPRINT      ESC;"[;60 G";"12 CPI (ELITE)"
150     LPRINT      ESC;"[;48 G";"15 CPI"
160     LPRINT      ESC;"[;72 C";"10 CPI"
170     LPRINT
180     LPRINT      ESC;"[6m";"PROPOERTIONAL MODE"
190     LPRINT      ESC;"[0m";"BACK TDO NORMAL"
200     LPRINT
210     LPRINT      ESC;"5m";"DOUBLE-WIDE MODE"
220     LPRINT      LPRINT ESC;"0m':"BACK TO NORMAL"
230     LPRINT
240     LPRINT      LPRINT ESC;"[1m";"BOLD PRINTING"
250     LPRINT      LPRINT ESC;"[0m";"BACK TO NORMAL"
260     LPRINT      LPRINT ESC;"[1m";"BOLD PRINTING"
270     LPRINT      LPRINT ESC;"[0m";"BACK TO NORMAL"
280     LPRINT
290     LPRINT      ESC;"L";"PARTIAL LINE UP ";
300     LPRINT      ESC;"K";"/ ";
310     LPRINT      ESC;"L";"BACK TO NORMAL"
320     LPRINT
340     LPRINT      ESC;"[4m";"UNDERLINE MODE"
350     LPRINT      ESC;"[0m";"BACK TO NORMAL"
260     LPRINT
370     LPRINT      " 1 2 3";
371     LPRINT      ' 4 5 6"
380     LPRINT      "123456789012345678901234567890123456789012345678901234567890";
381     LPRINT      "12345678901234567890"
390     LPRINT
400     LPRINT      ESC;"[10m";"DRAFT PRINT MODE"
410     REM
420     LPRINT      ESC;"[720;2880s"
430     REM
440     LPRINT      "LEFT MARGIN NOW BEGINS AT 1 INCH AND ";
441     LPRINT      "RIGHT MARGIN NOW ENDS AT 4 INCHES"
450     LPRINT      ESC;"[0;9792S"
460     REM
470     LPRINT      "LEFT MARGIN NOW BEGINS AT 0 INCH AND ";
471     LPRINT      "RIGHT MARGIN NOW ENDS AT 13.6 INCHES"
480     LPRINT
490     LPRINT      ESC;"[62m";"LQ PRINT MODE "
500     LPRINT
510     LPRINT      ESC;"[120; G";
520     FOR         [=1 TO 3
530     LPRINT      "1/6 INCH LINE FEED"
540     NEXT        I
550     LPRINT
560     LPRINT      ESC;"[90; G";
570     FOR         J=1 TO 3
580     LPRINT      "1/8 INCH LINE FEED"
590     NEXT        J
600     LPRINT      ESC;"[120; G";"NOW 1/6 INCH LINE FEED"
610     LPRINT      "A FORMFEED <FF> FOLLOWS THIS LINE";CHR$(12)
620     END
```

Basic Program Printed Output

```
FOLLOWING ARE SOME OF THIS PRINTER'S FEATURES USING THE ANSI EMULATION
10 CPI (PICA)
12 CPI (ELITE)
15 CPI
10 CPI

PROPORTIONAL MODE
BACK TO NORMAL

D O U B L E - W I D E   M O D E
BACK TO NORMAL

BOLD PRINTING
BACK TO NORMAL
BOLD PRINTING
BACK TO NORMAL
PARTIAL LINE UP
                / PARTIAL LINE DOWN BACK TO NORMAL

UNDERLINE MODE
BACK TO NORMAL

          1         2         3         4         5         6
12345678901234567890123456789012345678901234567890123456789012345678901234567890

DRAFT PRINT MODE
          LEFT MARGIN NOW BEGINS AT 1 IN
          CH AND RIGHT MARGIN NOW ENDS A
          T 4 INCHES

LEFT MARGIN NOW BEGINS AT 0 INCH AND RIGHT MARGIN NOW ENDS AT 13.6 INCHES

LQ PRINT MODE

1/6 INCH LINE FEED
1/6 INCH LINE FEED
1/6 INCH LINE FEED

1/8 INCH LINE FEED
1/8 INCH LINE FEED
1/8 INCH LINE FEED
NOW 1/6 INCH LINE FEED
A FORMFEED <FF> FOLLOWS THIS LINE
```

Chapter 5. Epson LQ1600K Emulation

DBCS Mode - Commands

Note: These commands are only valid for DBCS printing with the DBCS feature present.

DBCS mode is a special printer feature allowing the managing of specific commands dedicated to the handling and printing of the Double Byte Character Set (DBCS) as the GB18030 Standard Chinese set.

The DBCS mode feature is available by the selection the Epson LQ 1600K emulation at the “EMULATION” menu setting parameter. Other emulation selections do not support the DBCS mode.

Once the Epson LQ1600K has been selected, the DBCS mode is activated and deactivated through dedicated commands (FS & and FS).

When DBCS mode is activated, the printer prints the DBCS (GB18030) and recognizes and manages the incoming data and commands via the FS sequences.

In both cases, the Epson LQ 1600K emulation includes all the other Epson LQ standard ESC sequences, some of which can take effect immediately, even if DBCS mode is active, while some others are postponed until the printer exits the DBCS mode.

The following EPSON LQ Standard ESC sequences will work in DBCS mode:

ESC(W)*n* Set or cancel double width printing.

ESC(w)*n* Set or cancel double height printing.

Please refer to the other chapters of this manual for the complete list and description of the available ESC sequences.

FS &

Enter the DBCS print mode.

ASCII Code	FS &
Hexadecimal Value	X'1C' X'26'
Decimal Value	28 38

This command puts the printer in DBCS mode and recognizes all other FS commands, Epson standard ESC sequences, and prints all of the symbols of the GB18030 font set addressed by way of a single byte, two byte, and four byte address.

FS .

Exit the DBCS print mode.

ASCII Code	FS .
Hexadecimal Value	X'1C' X'2E'
Decimal Value	28 46

This command exits DBCS mode and the printer exits the GB18030 font set, prints with western font set, and recognizes all Epson standard ESC sequences. Only the FS & command is accepted to re-enter the DBCS mode.

FS SO

Sets double width mode.

ASCII Code	FS SO
Hexadecimal Value	X'1C' X'0E'
Decimal Value	28 14

All of the characters following this command are printed horizontally, enlarged two times. This print mode is reset by DC4, FS DC4 commands and automatically resets at the end of the line with a line terminator (LF, FF, CR, ...)

FS DC4

Resets double width mode.

ASCII Code	FS DC4
Hexadecimal Value	X'1C' X'14'
Decimal Value	28 20

This command resets the double width print mode previously set by the FS SO command.

FS W *n*

Sets - Resets quadruple print mode.

ASCII Code	FS W *n*
Hexadecimal Value	X'1C' X'57' *n*
Decimal Value	28 87 *n*
Range	*n* = 1 set *n* = 0 reset

This command sets (*n*=1) double width and double height print mode. The character dimension will be 2x2 the normal dimension.

With *n*=0 the double width/height print mode is reset.

FS J

Sets 90 degrees counterclockwise character rotation.

ASCII Code	FS J
Hexadecimal Value	X'1C' X'4A'
Decimal Value	28 74

Printable data after this command are rotated 90 degrees counterclockwise. This mode is also called vertical print.

FS K

Resets character rotation.

ASCII Code	FS K
Hexadecimal Value	X'1C' X'4B'
Decimal Value	28 75

This command resets the vertical print which was set by FS J and resumes horizontal printing.

FS D *d*1 *d*2

Composes two half-width, rotated characters into a normal size rotated character space.

ASCII Code	FS D d1 d2
Hexadecimal Value	X'1C' X'44' *d*1 *d*2
Decimal Value	• *d*1 = 1' character address • *d*2 = 2' character address

The *d*1 character is printed in half width and rotated 90° counterclockwise.

The *d*2 character is composed in half width, rotated 90° counterclockwise, and it is printed above the *d*1 character.

The occupied space is the same as a normal size rotated character.

FS - *n*

Sets - Resets underline mode.

ASCII Code	FS - *n*
Hexadecimal Value	X'1C' X'2D' *n*
Decimal Value	28 45 *n*
Range	*n* = 0 resets underline mode. *n* = 1 sets single underline mode. *n* = 2 sets double underline mode.

This command sets two different types of underline:
n=1 A single dotted line.
n=2 A double dotted line.

Unrelining character will terminate when a new FS- n command is received and *n*=0.

FS S *n*1 *n*2

Defines the left and right empty character space of a normal-sized character.

ASCII Code	FS S *n*1 *n*2
Hexadecimal Value	X'1C' X'53' *n*1 *n*2
Decimal Value	28 83 *n*1 *n*2

*n*1 and *n*2 are in *n*/180 of an inch.

*n*1 (1 to 127) defines the empty space at the left of the character cell. *n*2 (1 to 127) defines the empty space at the right of the character cell of each normal sized character.

The default values are: *n*1=0, *n*2=1.5.

For example, if a normal sized character cell is 12/180 wide, with the default values, the equivalent character per inch is 180/13.5 = 13.3 characters per inch.

FS T *n*1 *n*2

Defines the left and right empty character space of a half-sized character.

ASCII Code	FS T *n*1 *n*2
Hexadecimal Value	X'1C' X'54' *n*1 *n*2
Decimal Value	28 84 *n*1 *n*2

*n*1 and *n*2 are in *n*/180 of an inch.

*n*1 (1 to 127) defines the empty space at the left of the character cell. *n*2 (1 to 127) defines the empty space at the right of the character cell of each half sized character.

The default values are: *n*1=0, *n*2=1.5.

For example, if a half sized character cell is 12/180 wide, with the default values, the equivalent character per inch is 180/13.5 = 13.3 char./inch.

FS U

Define half-sized character as half of a normal sized character.

ASCII Code	FS U
Hexadecimal Value	X'1C' X'55'
Decimal Value	28 85

This command sets the size of the character to be half of the normal size including the left and right empty space so that two half sized characters occupy the same space of one normal sized character.

FS SI

Sets the print of half-sized characters.

ASCII Code	FS SI
Hexadecimal Value	X'1C' X'0F'
Decimal Value	28 15

This command sets the print of half sized characters as defined by the FS U and FS T commands.

FS V

Resets print of half-sized characters.

ASCII Code	FS V
Hexadecimal Value	X'1C' X'56'
Decimal Value	28 86

This command cancels the print of half sized characters.

FS *r n*

Sets superscript or subscript print mode (1/4 normal size).

ASCII Code	FS *r n*
Hexadecimal Value	X'1C' X'72' *n*
Decimal Value	28 114 *n*
	n=0 set superscript print
	n=1 set subscript print

This command sets printing of superscript and subscript characters. The size of the characters is 1/4 of normal size. The character prints in the upper area (superscript) or lower area (subscript). For example, $^{\text{superscript}}$ and $_{\text{subscript}}$.

FS DC2

Cancels half-sized and 1/4-sized print and restores normal size print.

ASCII Code	FS DC2
Hexadecimal Value	X'1C' X'12'
Decimal Value	28 18

This command cancels printing of superscript and subscript characters. Normal sized printing is resumed.

FS *x n*

Sets print quality level for the DBCS font set.

ASCII Code	FS *x n*
Hexadecimal Value	X'1C' X'78' *n*
Decimal Value	28 120 *n*
	n=0 set Draft (high speed)
	n=1 set Quality (low speed)

There are four type of print quality level, two for Draft mode and two for Quality mode. A specific Menu Item (see the *User Manual*) assigns which of the two Draft modes is activated when the parameter *n* is equal to 0 and which of the two Quality modes is activated when the parameter *n* is equal to 1.

n=0 Activate the NLQ or LQ mode as specified with the “SW Qual-Level” menu item.

n=1 Activates the Draft or Best Draft mode as specified with the “SW Qual-Level” menu item.

FS 2 a^1 a^2 n^1 ... n^{72}

Sets user-defined character (DownLoading).

ASCII Code	FS 2 a^1 ... n^{72}
Hexadecimal Value	X'1C' X'32' ...
Decimal Value	28 50 ...

a^1 a^2 = The address of the GB18030 character set where the character to download has to be allocated.

The address must be included in the following ranges: X'AAA1' to X'AFFE', X'F8A1' to X'FEFE', X'A140' to X'A7A0'.

n^1 ... n^{72} = The shape of the character in dots as defined over a matrix of 24vx24h dot matrix.

Three bytes in vertical are equivalent to the 24 dots of any column; when multiplied by 24 columns it is equal to 72 bytes in total per character.

FS ! *n*

Sets multiple print attribute at once.

ASCII Code	FS ! *n*
Hexadecimal Value	X'1C' X'21' *n*
Decimal Value	28 33 *n*

This command sets multiple print attributes depending on the *n* parameter as follows:

	Bit=1	Bit=0
Bit 7	underline	–
Bit 6	–	–
Bit 5	subscript	superscript
Bit 4	1/4 size	–
Bit 3	double height	–
Bit 2	double width	–
Bit 1	half size	–
Bit 0	rotate print	normal print

FS *v n*

Sets - Cancels line drawing character connection mode.

ASCII Code	FS *v n*
Hexadecimal Value	X'1C' X'76' *n*
Decimal Value	28 118 *n*

When *n*=1, this command allows the printer to fill the horizontal and vertical breaking point of a table that is being printed. This is accomplished by adding special horizontal or vertical line drawing characters.

These characters are in the following address ranges: X'A854' to X'A970', X'A9A4' to X'A9A7', X'A9B0' to X'A9BF'.

When *n*=0, the function is cancelled.

FS *c nl nh*

Sets the HMI (Horizontal Motion Index)

ASCII Code	FS *c nl nh*
Hexadecimal Value	X'1C' X'63' *nl nh*
Decimal Value	28 99 *nl nh*

This command defines the horizontal motion (space) occupied by a full size character. The horizontal motion is specified in *n*/180 of inch and its value is: HMI = ((*nh* * 256) + *nl*) * 1/180".

FS *b n*

Sets the DBCS standard line.

ASCII Code	FS *b n*
Hexadecimal Value	X'1C' X'62' *n*
Decimal Value	28 98 *n*

This command defines the position of the base line of the character.

n=0 The base line is the current print position.

n=1 The base line is 24/180 of and inch below the current position.

ESC (X *n*1 *n*2 *a*1 *a*2 *a*3

Defines a special printing effect.

ASCII Code	ESC (X
Hexadecimal Value	X'1B' X'28' X'58' ...
Decimal Value	27 40 88 ...

n=1 Fixed to 3.
n=2 Fixed to 0.
a=0 Applies the special effect externally to the characters.
a=1 Applies the special effect internally to the character (if the character is outlined) – function not supported
a=0 Resets any special effect.
a=1 Reverse the print (white character on a black background).
a=2 Fills the area with light gray tone.
a=3 Fills the area with medium gray tone.
a=4 Fills the area with high grey tone.

ESC | *n*

Sets – Resets double width and double height print modes.

ASCII Code	ESC | *n*
Hexadecimal Value	X'1B' X'49' *n*
Decimal Value	27 73 *n*

This command sets and resets the following print modes as follows:
n=A Resets double width and double height.
n=B Sets double width.
a=C Sets double height.
a=D Sets double width and height.

Appendix A. Tables

This section contains the character sets and the hexadecimal to decimal conversion table.

Character Sets

	00	10	20	30	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0
00	NUL		SP	0	@	P	’	p	NUL		á	¦	À	Ð	a	=
01		DC1	!	1	A	Q	a	q		DC1	í	¦	Á	Ñ	ß	±
02		DC2	“	2	B	R	b	r		DC2	ó	¦	Â	Ò	G	=
03		DC3	#	3	C	S	c	s		DC3	ú	³	Ã	Ó	p	=
04		DC4	$	4	D	T	d	t		DC4	ñ	´	Ä	Ô	S	(
05			%	5	E	U	e	u			Ñ	µ	Å	Õ	s	)
06			&	6	F	V	f	v			ª	¶	Æ	Ö	µ	÷
07	BEL		‘	7	G	W	g	w	BEL		º	·	Ç	×	t	~
08	BS	CAN	(	8	H	X	h	x	BS	CAN	¿	¸	È	Ø	F	°
09	HT		)	9	I	Y	i	y	HT		¬	¹	É	Ù	T	·
0A	LF		*	:	J	Z	j	z	LF		¬	º	Ê	Ú	O	·
0B	VT	ESC	+	;	K	[	k	{	VT	ESC	½	»	Ë	¦	d	v
0C	FF		,	<	L	\	l	|	FF		¼	¼	Ì	_	8	n
0D	CR		-	=	M	]	m	}	CR		¡	½	Í	¦	f	²
0E	SO		.	>	N	^	n	~	SO		«	¾	Î	¦	e	¦
0F	SI		/	?	O	_	o	DEL	SI		»	¿	Ï	¯	n	SP

Figure 1. Character Set 1

	00	10	20	30	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0
00	NUL		SP	0	@	P	’	p	Ç	É	á	¦	À	Đ	a	=
01		DC1	!	1	A	Q	a	q	ü	æ	í	¦	Á	Ñ	ß	±
02	`	DC2	“	2	B	R	b	r	é	Æ	ó	¦	Â	Ò	G	=
03	□	DC3	#	3	C	S	c	s	â	ô	ú	³	Ã	Ó	p	=
04	□	DC4	$	4	D	T	d	t	ä	ö	ñ	´	Ä	Ô	S	(
05	□	§	%	5	E	U	e	u	à	ò	Ñ	µ	Å	Õ	s	)
06	□		&	6	F	V	f	v	å	û	ª	¶	Æ	Ö	µ	÷
07	BEL		‘	7	G	W	g	w	ç	ù	º	·	Ç	×	t	~
08	BS	CAN	(	8	H	X	h	x	ê	ÿ	¿	¸	È	Ø	F	°
09	HT		)	9	I	Y	i	y	ë	ö	¬	¹	É	Ù	T	·
0A	LF		*	:	J	Z	j	z	è	Ü	¬	º	Ê	Ú	O	·
0B	VT	ESC	+	;	K	[	k	{	ï	¢	½	»	Ë	¦	d	v
0C	FF		,	<	L	\	l	|	î	£	¼	¼	Ì	_	8	n
0D	CR		-	=	M	]	m	}	ì	¥	i	½	Í	¦	f	²
0E	SO		.	>	N	^	n	~	Ä	P	«	¾	Î	¦	e	¦
0F	SI		/	?	O	_	o	DEL	Å	ƒ	»	¿	Ï	¯	n	SP

Figure 2. Character Set 2

ANSI Emulation

Character Set 1 Enabled (8 Bit Control Disabled)

Table 6. Character Set 1 Enabled (8 Bit Control Disabled)

	00	10	20	30	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0
00	NUL		SP	x	x	x	x	x			x	x	x	x	x	x
01		DC1	x	x	x	x	x	x		DC1	x	x	x	x	x	x
02			x	x	x	x	x	x			x	x	x	x	x	x
03	ETX	DC3	x	x	x	x	x	x		DC3	x	x	x	x	x	x
04			x	x	x	x	x	x			x	x	x	x	x	x
05	ENQ		x	x	x	x	x	x			x	x	x	x	x	x
06	ACK		x	x	x	x	x	x			x	x	x	x	x	x
07	BEL		x	x	x	x	x	x	BEL		x	x	x	x	x	x
08	BS		x	x	x	x	x	x	BS		x	x	x	x	x	x
09	HT		x	x	x	x	x	x	HT		x	x	x	x	x	x
0A	LF		x	x	x	x	x	x	LF		x	x	x	x	x	x
0B	VT	ESC	x	x	x	x	x	x	VT	ESC	x	x	x	x	x	x
0C	FF		x	x	x	x	x	x	FF		x	x	x	x	x	x
0D	CR		x	x	x	x	x	x	CR		x	x	x	x	x	x
0E	SO		x	x	x	x	x	x	SO		x	x	x	x	x	x
0F	SI		x	x	x	x	x	DEL	SI		x	x	x	x	x	

Character Set 1 Enabled (8 Bit Control Disabled)

Table 7. Character Set 1 Enabled (8 Bit Control Disabled)

	00	10	20	30	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0
00	NUL		SP	x	x	x	x	x			x	x	x	x	x	x
01		DC1	x	x	x	x	x	x		DC1	x	x	x	x	x	x
02			x	x	x	x	x	x			x	x	x	x	x	x
03	ETX	DC3	x	x	x	x	x	x		DC3	x	x	x	x	x	x
04			x	x	x	x	x	x			x	x	x	x	x	x
05	ENQ		x	x	x	x	x	x			x	x	x	x	x	x
06	ACK		x	x	x	x	x	x			x	x	x	x	x	x
07	BEL		x	x	x	x	x	x	BEL		x	x	x	x	x	x
08	BS		x	x	x	x	x	x	BS		x	x	x	x	x	x
09	HT		x	x	x	x	x	x	HT		x	x	x	x	x	x
0A	LF		x	x	x	x	x	x	LF		x	x	x	x	x	x
0B	VT	ESC	x	x	x	x	x	x	VT	ESC	x	x	x	x	x	x
0C	FF		x	x	x	x	x	x	FF		x	x	x	x	x	x
0D	CR		x	x	x	x	x	x	CR		x	x	x	x	x	x
0E	SO		x	x	x	x	x	x	SO		x	x	x	x	x	x
0F	SI		x	x	x	x	x	DEL	SI		x	x	x	x	x	

Character Set 1 Enabled (8 Bit Control Enabled)

Table 8. Character Set 1 Enabled (8 Bit Control Enabled)

	00	10	20	30	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0
00	NUL		SP	x	x	x	x	x		DCS	x	x	x	x	x	x
01		DC1	x	x	x	x	x	x		PU1	x	x	x	x	x	x
02			x	x	x	x	x	x			x	x	x	x	x	x
03	ETX	DC3	x	x	x	x	x	x			x	x	x	x	x	x
04			x	x	x	x	x	x	IND		x	x	x	x	x	x
05	ENQ	x	x	x	x	x	x	x	NEL		x	x	x	x	x	x
06	ACK		x	x	x	x	x	x			x	x	x	x	x	x
07	BEL		x	x	x	x	x	x			x	x	x	x	x	x
08	BS		x	x	x	x	x	x	HTS		x	x	x	x	x	x
09	HT		x	x	x	x	x	x			x	x	x	x	x	x
0A	LF		x	x	x	x	x	x	VTS		x	x	x	x	x	x
0B	VT	ESC	x	x	x	x	x	x	PLD	CSI	x	x	x	x	x	x
0C	FF		x	x	x	x	x	x	PLU	ST	x	x	x	x	x	x
0D	CR		x	x	x	x	x	x	RI		x	x	x	x	x	x
0E	SO		x	x	x	x	x	x			x	x	x	x	x	x
0F	SI		x	x	x	x	x	DEL			x	x	x	x	x	

Character Set 2 Enabled

Table 9. Character Set 2 Enabled

	00	10	20	30	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0
00	NUL		SP	x	x	x	x	x	x	x	x	x	x	x	x	x
01		DC1	x	x	x	x	x	x	x	x	x	x	x	x	x	x
02			x	x	x	x	x	x	x	x	x	x	x	x	x	x
03	ETX	DC3	x	x	x	x	x	x	x	x	x	x	x	x	x	x
04			x	x	x	x	x	x	x	x	x	x	x	x	x	x
05	ENQ	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
06	ACK		x	x	x	x	x	x	x	x	x	x	x	x	x	x
07	BEL		x	x	x	x	x	x	x	x	x	x	x	x	x	x
08	BS		x	x	x	x	x	x	x	x	x	x	x	x	x	x
09	HT		x	x	x	x	x	x	x	x	x	x	x	x	x	x
0A	LF		x	x	x	x	x	x	x	x	x	x	x	x	x	x
0B	VT	ESC	x	x	x	x	x	x	x	x	x	x	x	x	x	x
0C	FF		x	x	x	x	x	x	x	x	x	x	x	x	x	x
0D	CR		x	x	x	x	x	x	x	x	x	x	x	x	x	x
0E	SO		x	x	x	x	x	x	x	x	x	x	x	x	x	x
0F	SI		x	x	x	x	x	DEL	x	x	x	x	x	x	x	

EPSON National Variations

Table 10. EPSON National Variations

	35	36	64	91	92	93	94	96	123	124	125	126	(dec.)
USA	#	$	@	[	\	]	^	‘	{	|	}	~	
FRANCE			à	º	ç	§			é	ù	è	¨	
GERMANY			§	Ä	Ö	Ü			ä	ö	ü	ë	
UNITED KINGDOM	£												
DENMARK-1				Ä	Ø	Â			ä	ø	â		
SWEDEN		¤	É	Ä	Ö	Â	Ü	é	ä	ö	â	ü	
ITALY				°		é		ù	à	ò	è	ì	
SPAIN-1		§		¡	Ñ	¿			"	ñ			
JAPAN					¥								
NORWAY		¤	É	Ä	Ö	Â	Ü	é	ä	ö	â	ü	
DENMARK-2			É	Ä	Ö	Â	Ü	é	ä	ö	â	ü	
SPAIN-2			á	Í	Ñ	¿	é		í	ñ	ó	ú	
LATIN AMERICA			á	Í	Ñ	¿	é	ü	í	ñ	ó	ú	
	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E	(hex.)

ANSI National Variations

	33	35	36	38	39	42	59	64	91	92	93	94	96	113	123	124	125	126	(dec.)
USA	!	#	$	&	'	*	;	@	[	\	]	^	`	q	{	|	}	~	
German	!	#	$	&	'	*	;	§	Ä	Ö	Ü	^	`	q	ä	ö	ü	ß	
French A	!	£	$	&	'	*	;	à	°	ç	§	^	`	q	é	ù	è	¨	
French B	!	#	à	‡	'	*	;	é	â	\	ù	î	ç	q	{	|	}	ô	
French/Canadian	!	#	$	&	'	*	;	À	Â	ç	Ê	Î	Ô	q	é	ù	è	û	
Netherlands	!	#	ƒ	&	'	*	;	@	[	\	]	¯	¨	q	¨	|	ij	~	
Italian	!	£	¢	&	'	*	;	§	°	ç	é	^	ù	q	à	ò	è	ì	
United Kingdom	!	£	$	&	'	*	;	@	[	\	]	^	`	q	{	|	}	~	
Spanish	!	¡	$	&	'	*	;	@	¡	Ñ	¿	^	`	q	¨	ñ	}	~	
Danish/Norwegian A	!	#	¤	&	'	*	;	É	Æ	Ø	Å	^	`	q	æ	ø	å	~	
Danish/Norwegian B	!	#	¤	&	'	*	;	É	Æ	Ø	Å	^	`	q	æ	ø	å	~	
Danish/Norwegian C	!	#	¤	&	'	*	;	É	Æ	Ø	Å	Ü	é	q	æ	ø	å	ü	
Danish/Norwegian D	!	#	¤	&	'	*	;	É	Æ	Ø	Å	Ü	é	q	æ	ø	å	ü	
Swedish/Finnish A	!	#	¤	&	'	*	;	É	Ä	Ö	Å	^	`	q	ä	ö	å	~	
Swedish/Finnish B	!	#	¤	&	'	*	;	É	Ä	Ö	Å	^	`	q	ä	ö	å	~	
Swedish/Finnish C	!	#	¤	&	'	*	;	É	Ä	Ö	Å	Ü	é	q	ä	ö	å	ü	
Swedish/Finnish D	!	#	¤	&	'	*	;	É	Ä	Ö	Å	Ü	é	q	ä	ö	å	ü	
Switzerland	!	#	$	&	'	*	;	ç	à	é	ê	^	`	q	ä	ö	ü	~	
USA (ISO)	!	#	$	&	'	*	;	@	[	\	]	^	`	q	{	|	}	~	
Yugoslavia	!	#	$	&	'	*	;	Š	Đ	Ž	Ć	Č	ž	q	š	đ	ć	č	
United Kingdom A	!	£	¢	&	'	*	;	@	[	\	]	^	`	q	{	|	}	~	
Turkey	!	ö	$	&	'	*	;	Ç	Ğ	İ	Ö	Ü	ç	ğ	ş	ı	ö	ü	
Greece	Γ	Δ	Σ	Φ	Λ	Ψ	Ξ	π	Σ	Φ	Ψ	Ω	`	q	{	|	}	~	
Cyrillic	;	#	$	&	'	*	;	@	[	\	]	^	`	q	{	|	}	~	
	21	23	24	26	27	2A	3B	40	5B	5C	5D	5E	60	71	7B	7C	7D	7E	(hex.)

Figure 3. ANSI National Variations

IBM National Variations

USA (CP 437)

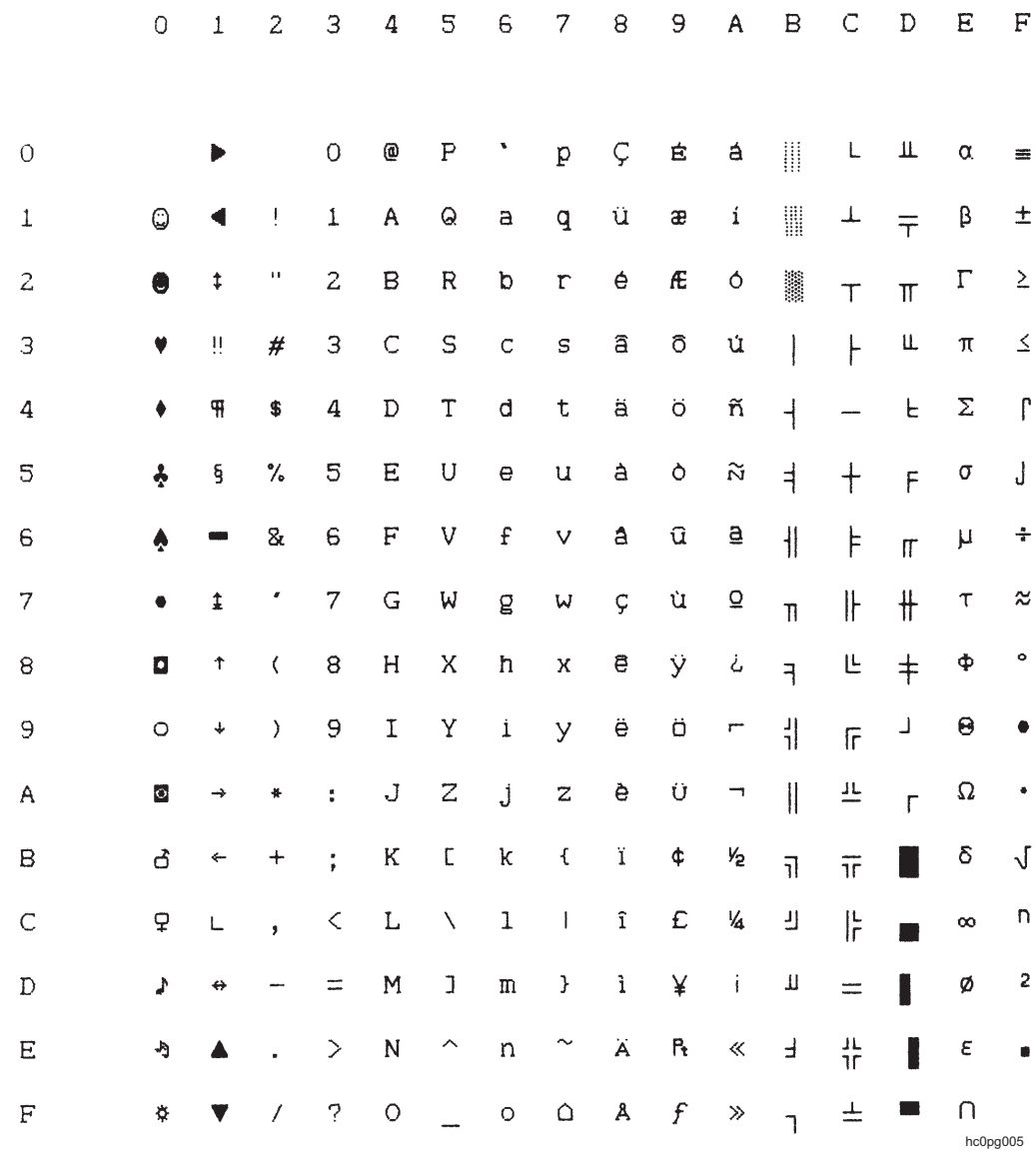


Figure 4. USA (CP 437)

Greek (CP 437-G)

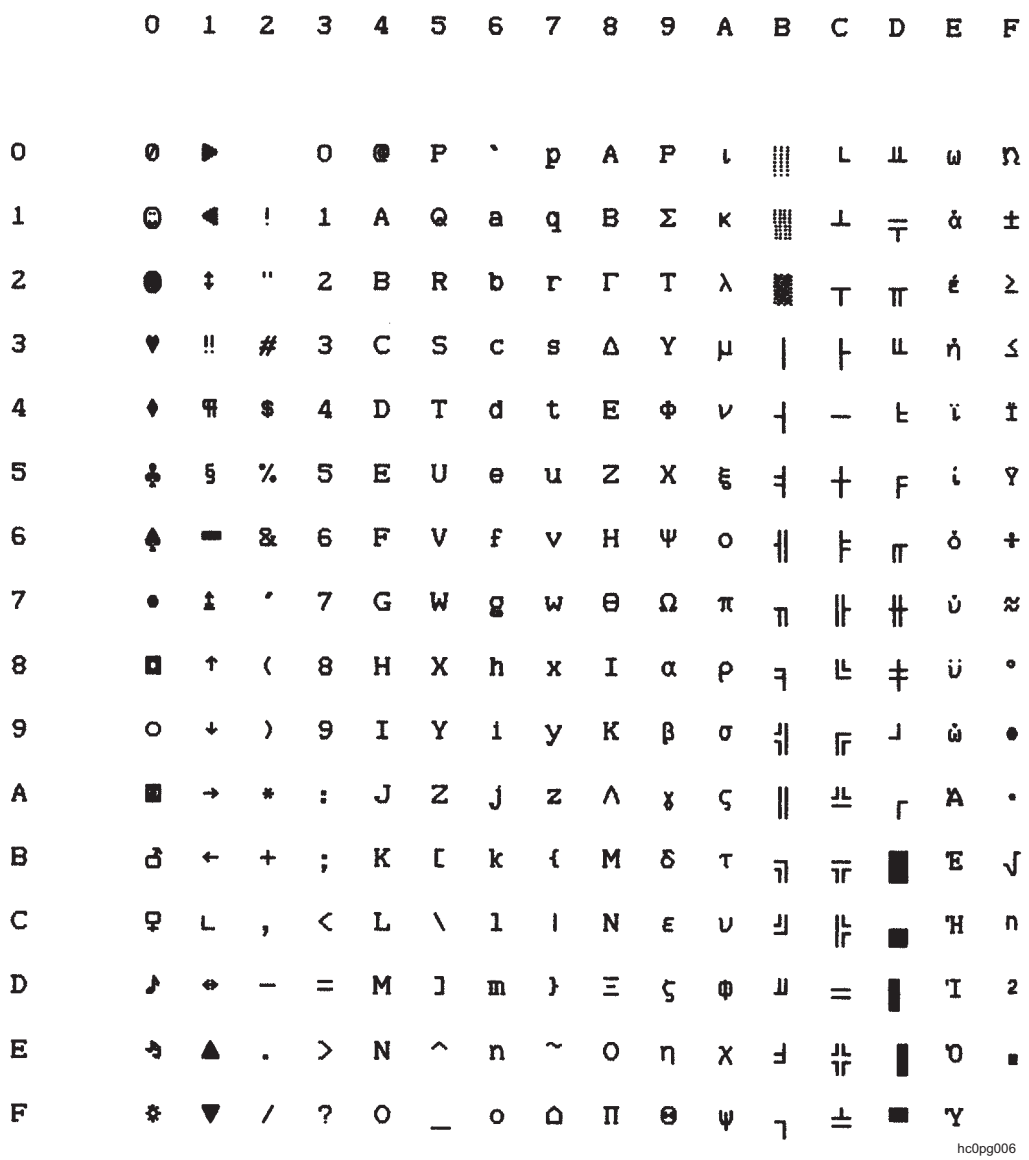
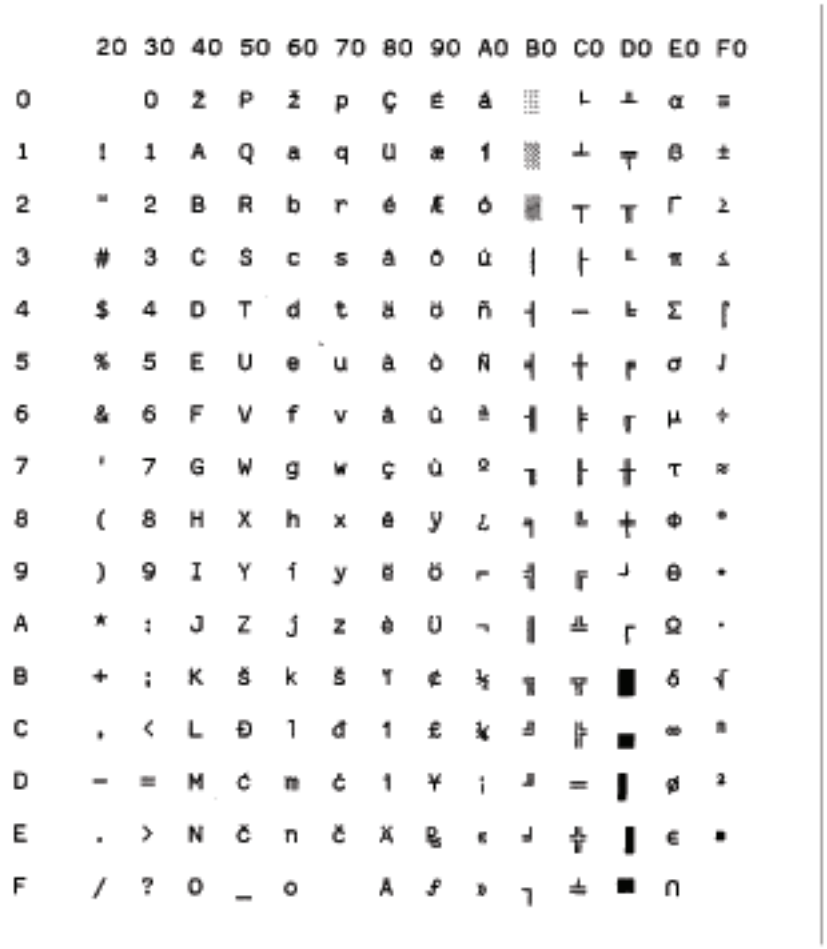


Figure 5. Greek (CP 437-G)

Croatian (CP 437-SLAVIC)



	20	30	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0
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Figure 6. Croatian (CP 437-SLAVIC)

Multilingual (CP 850)

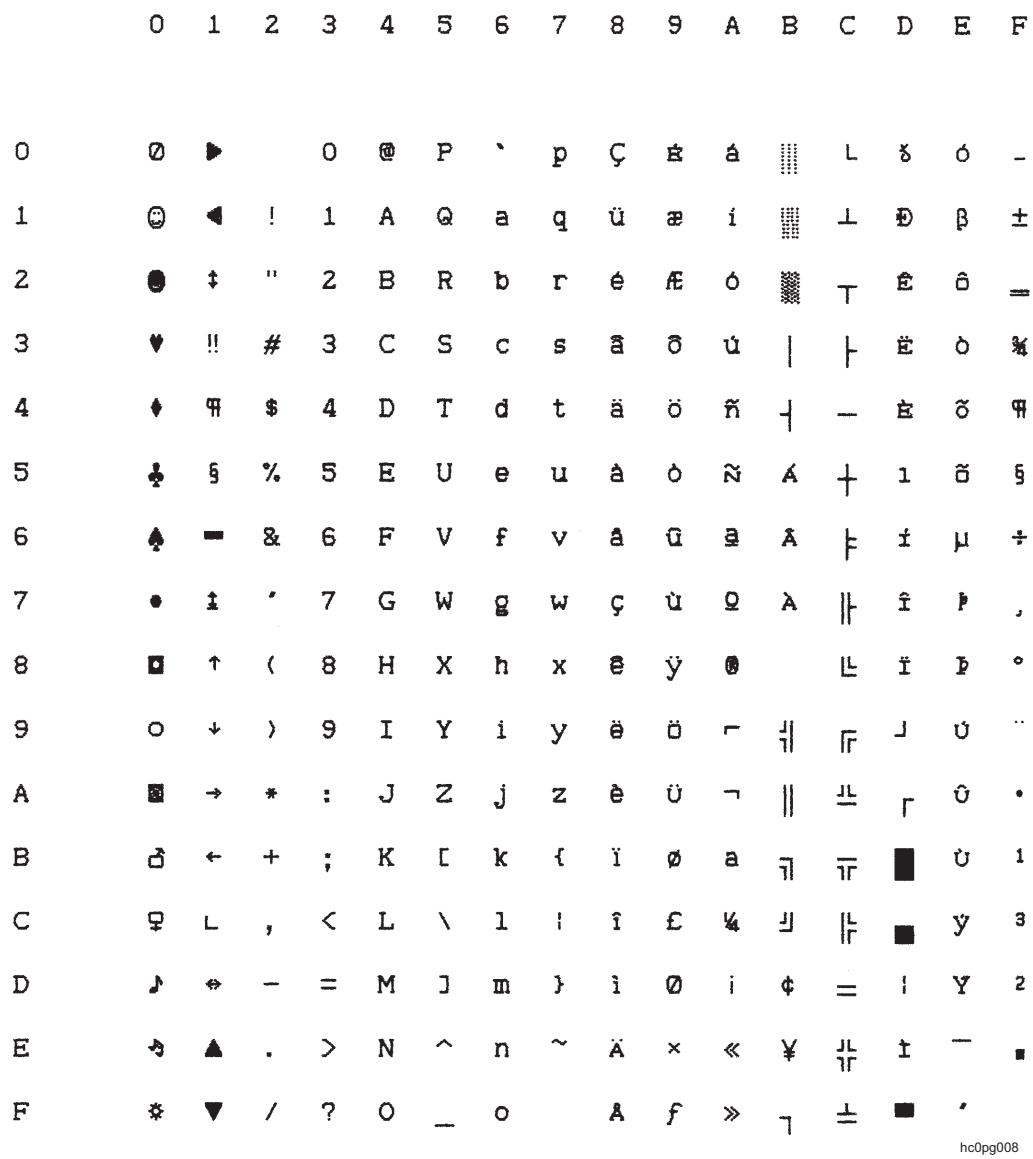

Figure 7. Multilingual (CP 850)

Greek (CP 851)

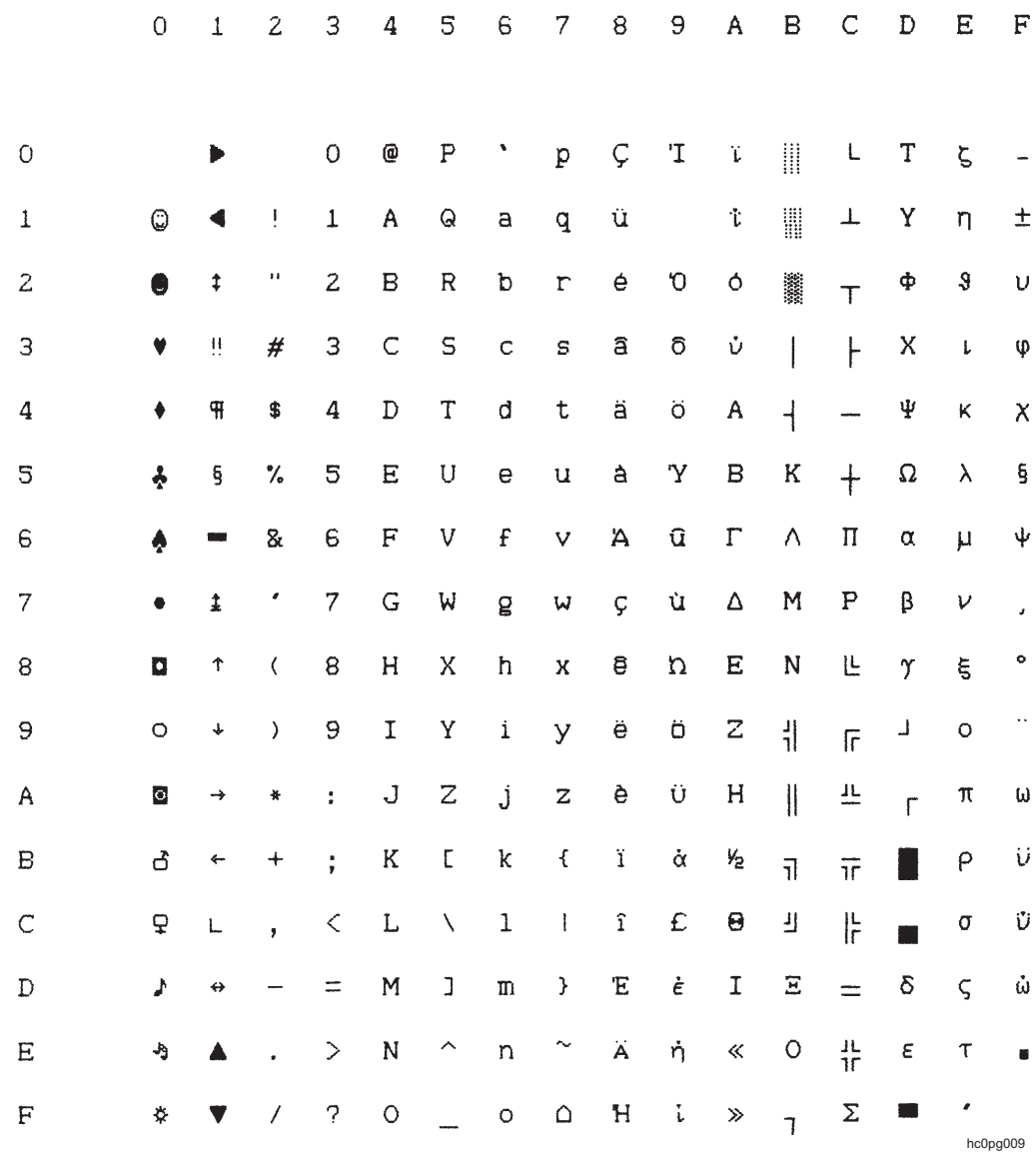

Figure 8. Greek (CP 851)

Eastern Europe (CP 852)

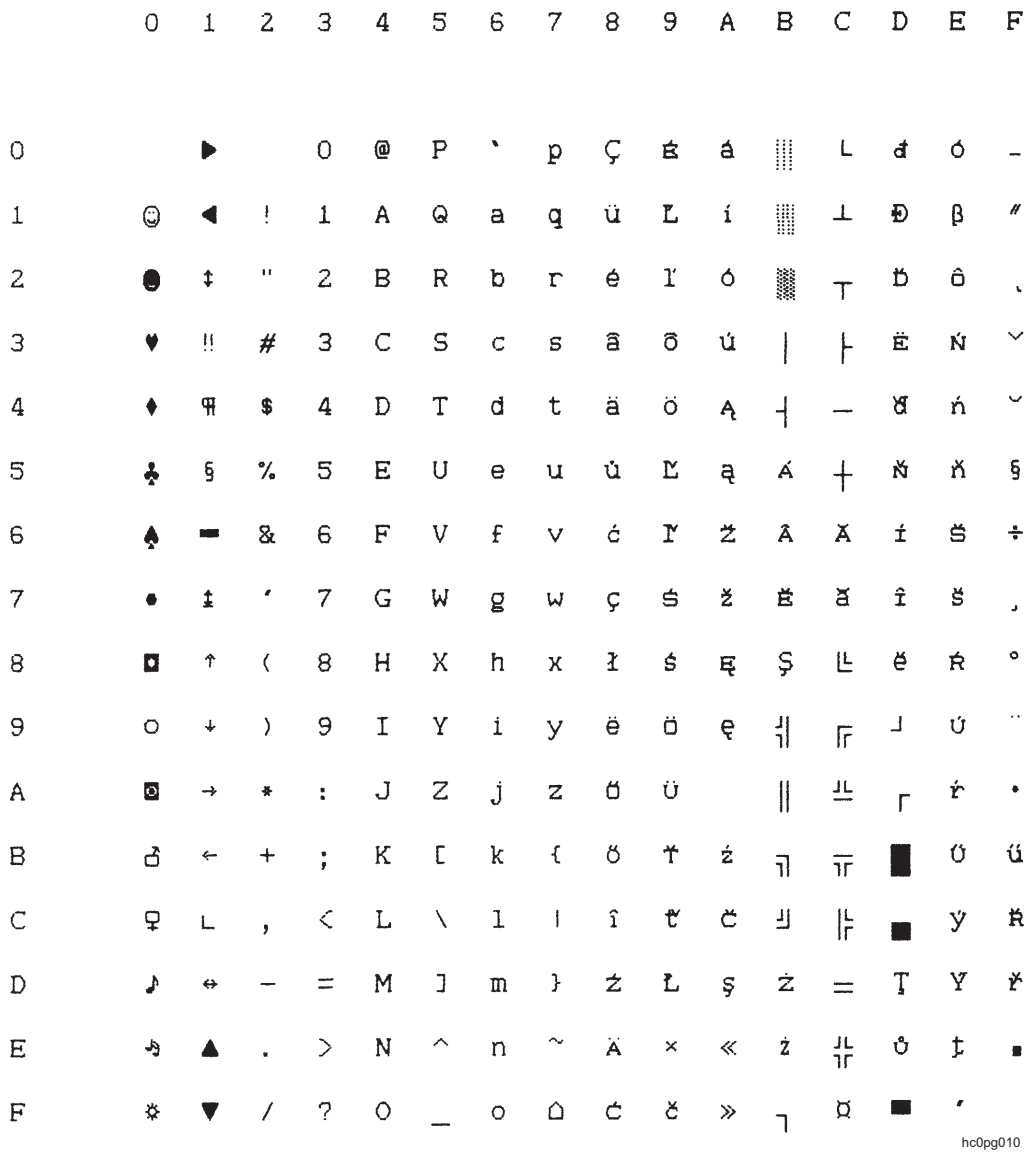

Figure 9. Eastern Europe (CP 852)

Turkish (CP 853)

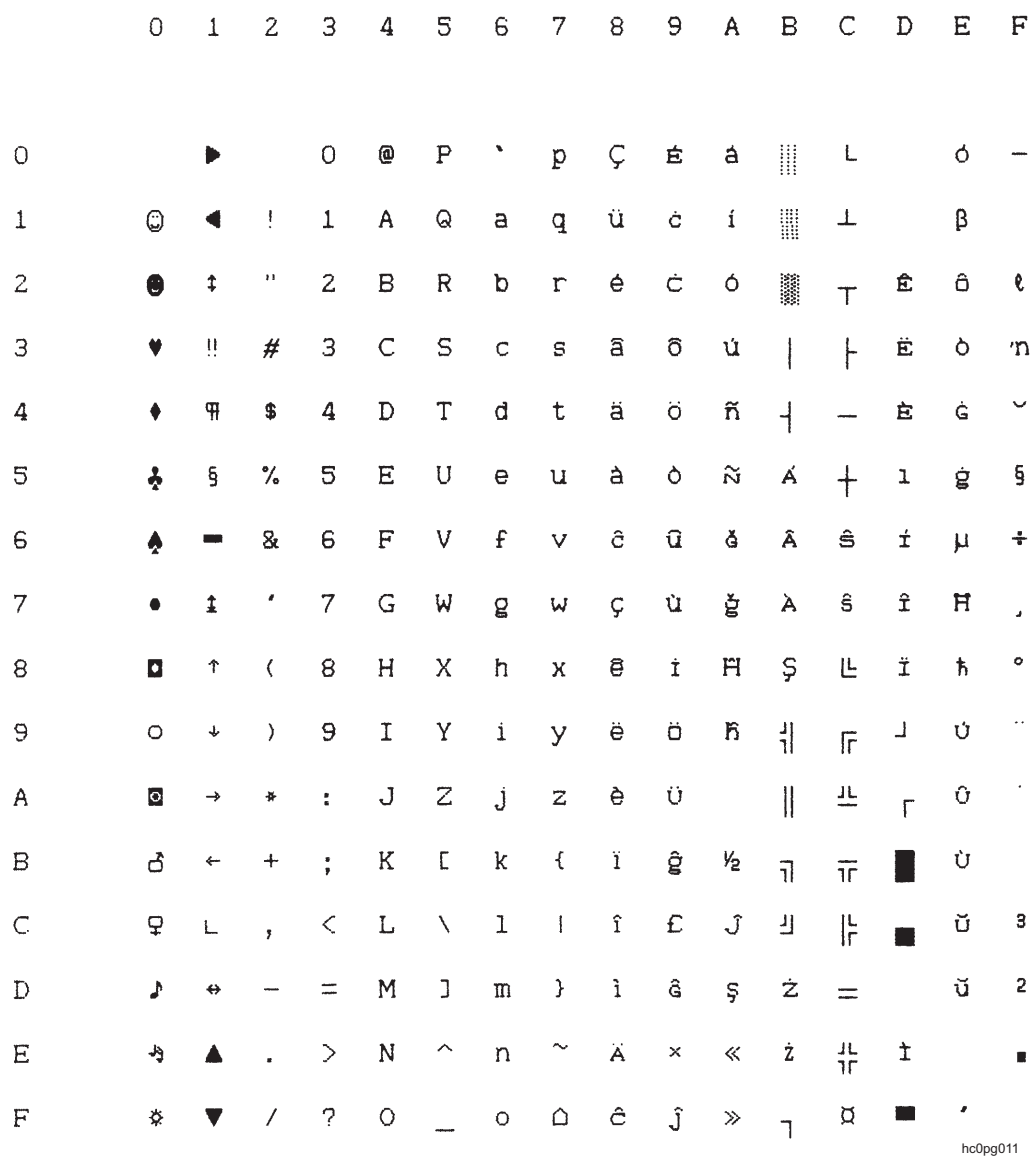

Figure 10. Turkish (CP 853)

Cyrillic (CP 855)

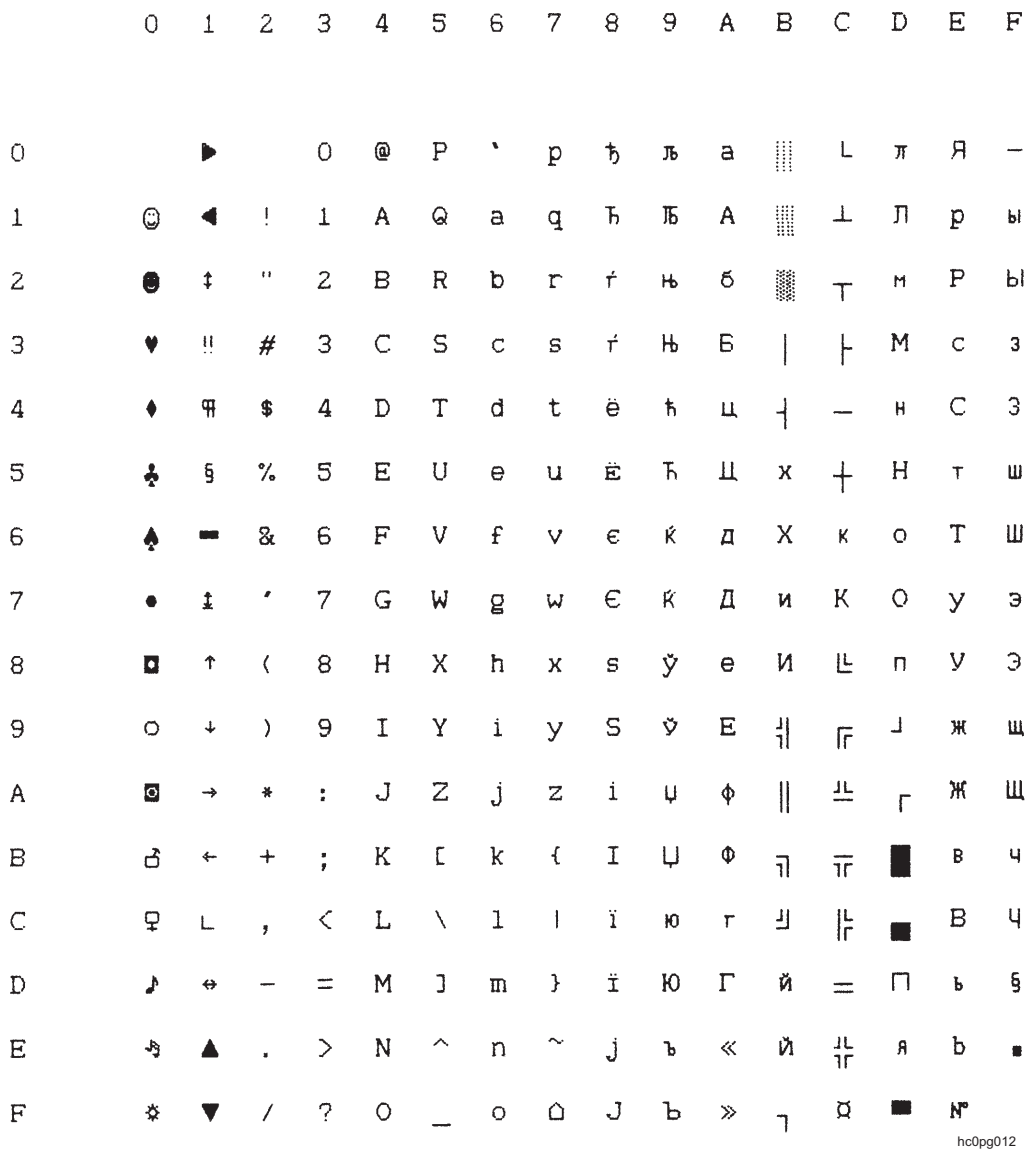

Figure 11. Cyrillic (CP 855)

Turkish (CP 857)

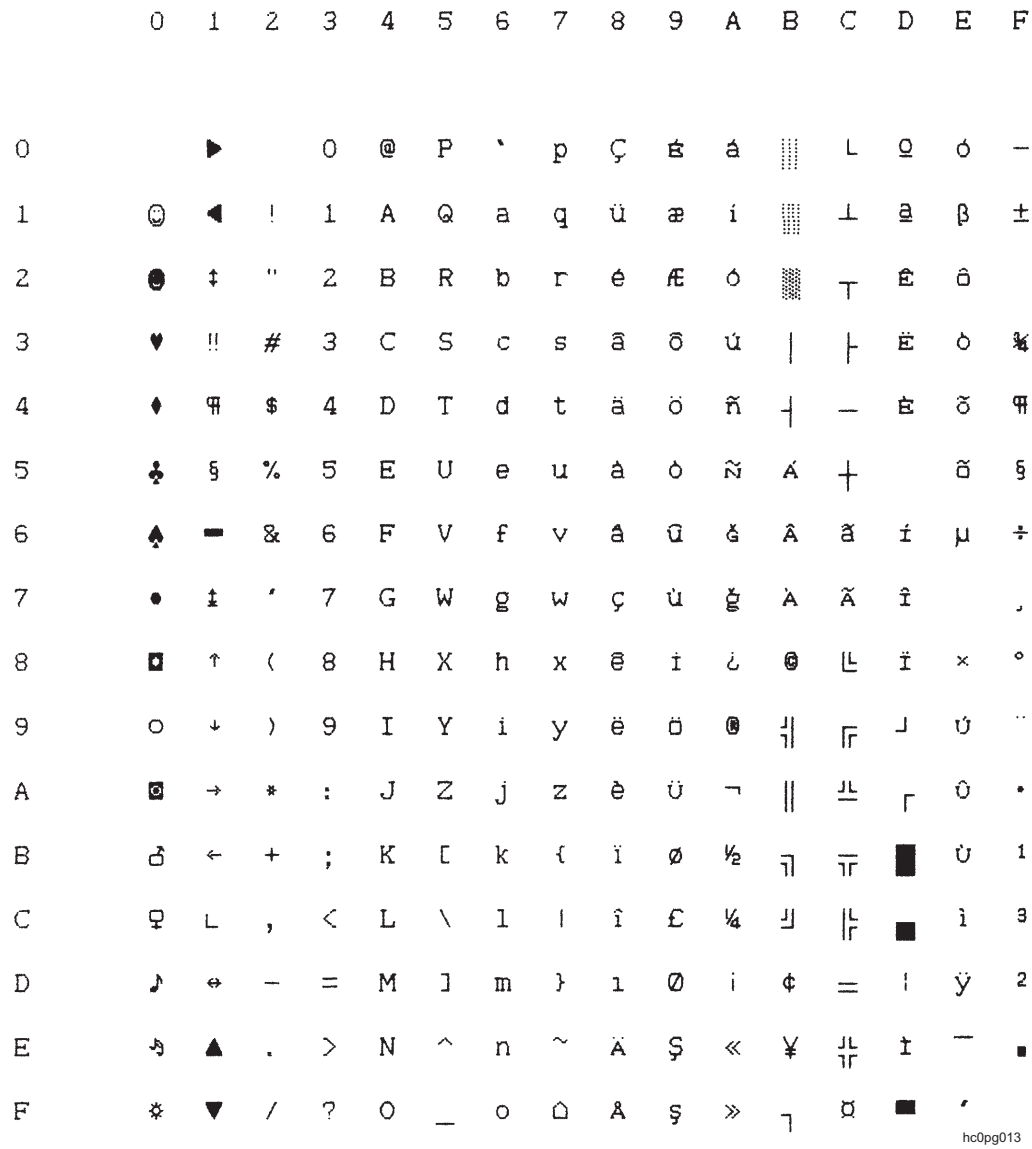

Figure 12. Turkish (CP 857)

Euro PC Multilingual (CP 858)

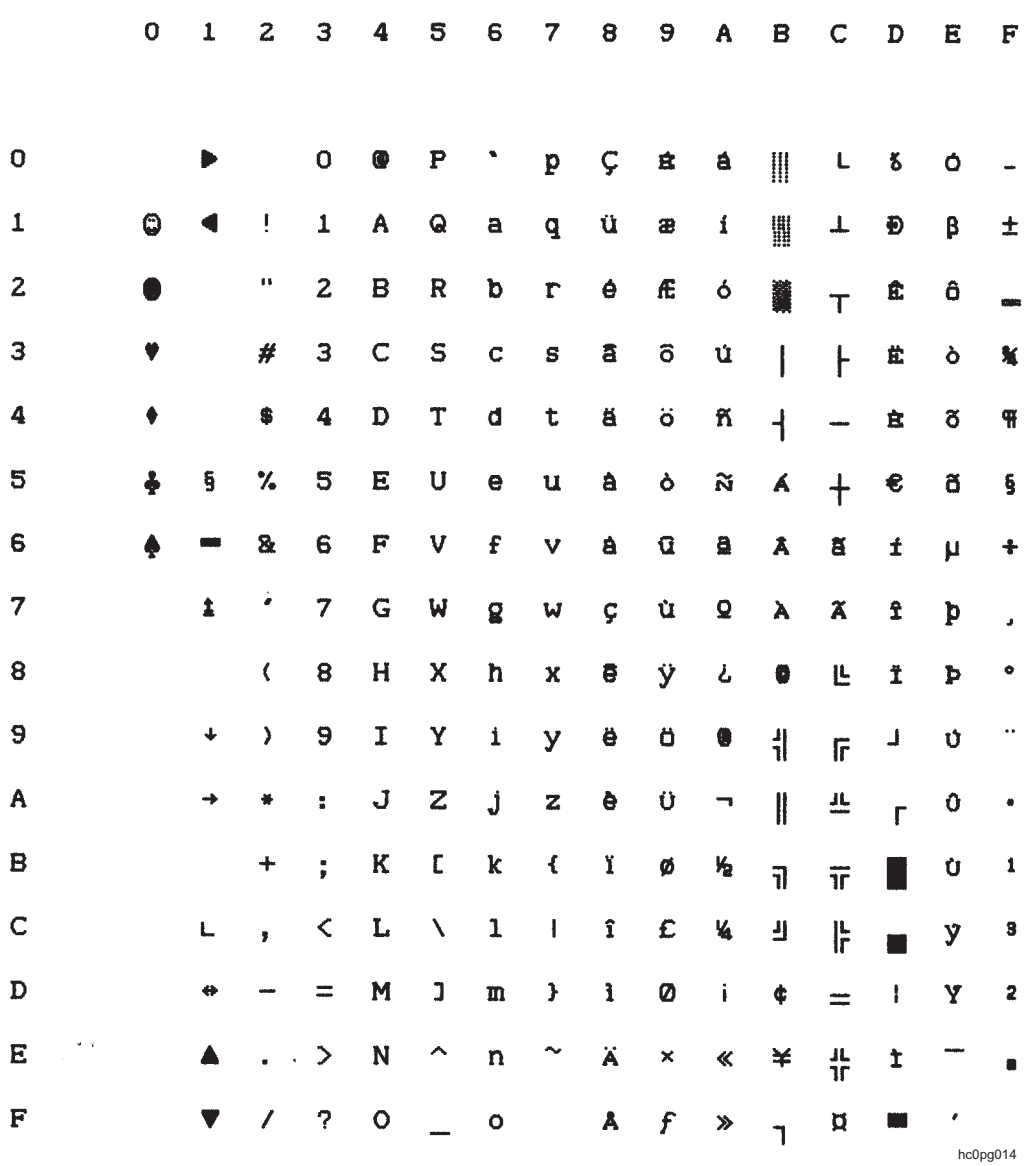

Figure 13. Euro PC Multilingual (CP 858)

Portugal (CP 860)

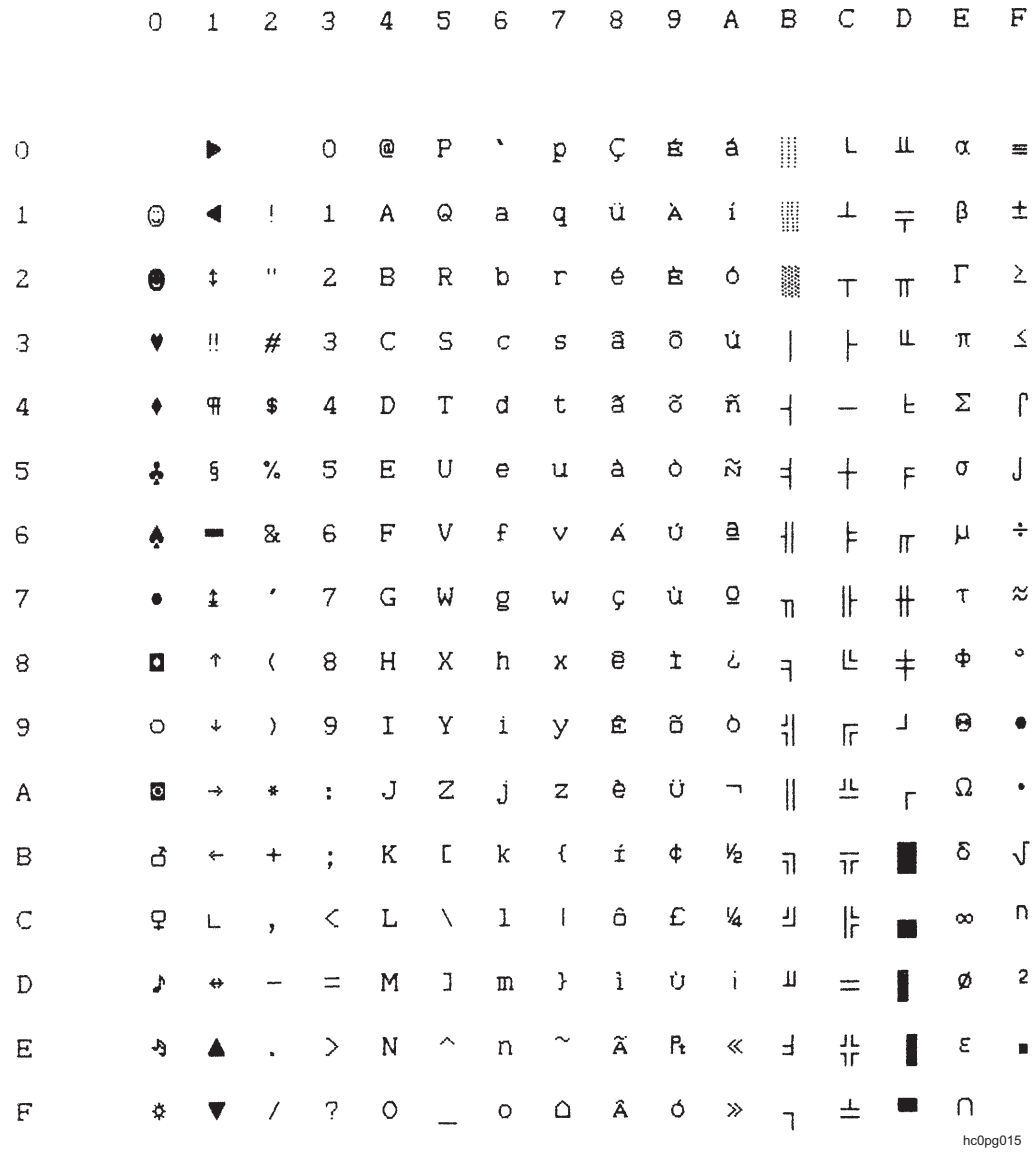

Figure 14. Portugal (CP 860)

Hebrew (CP 862)

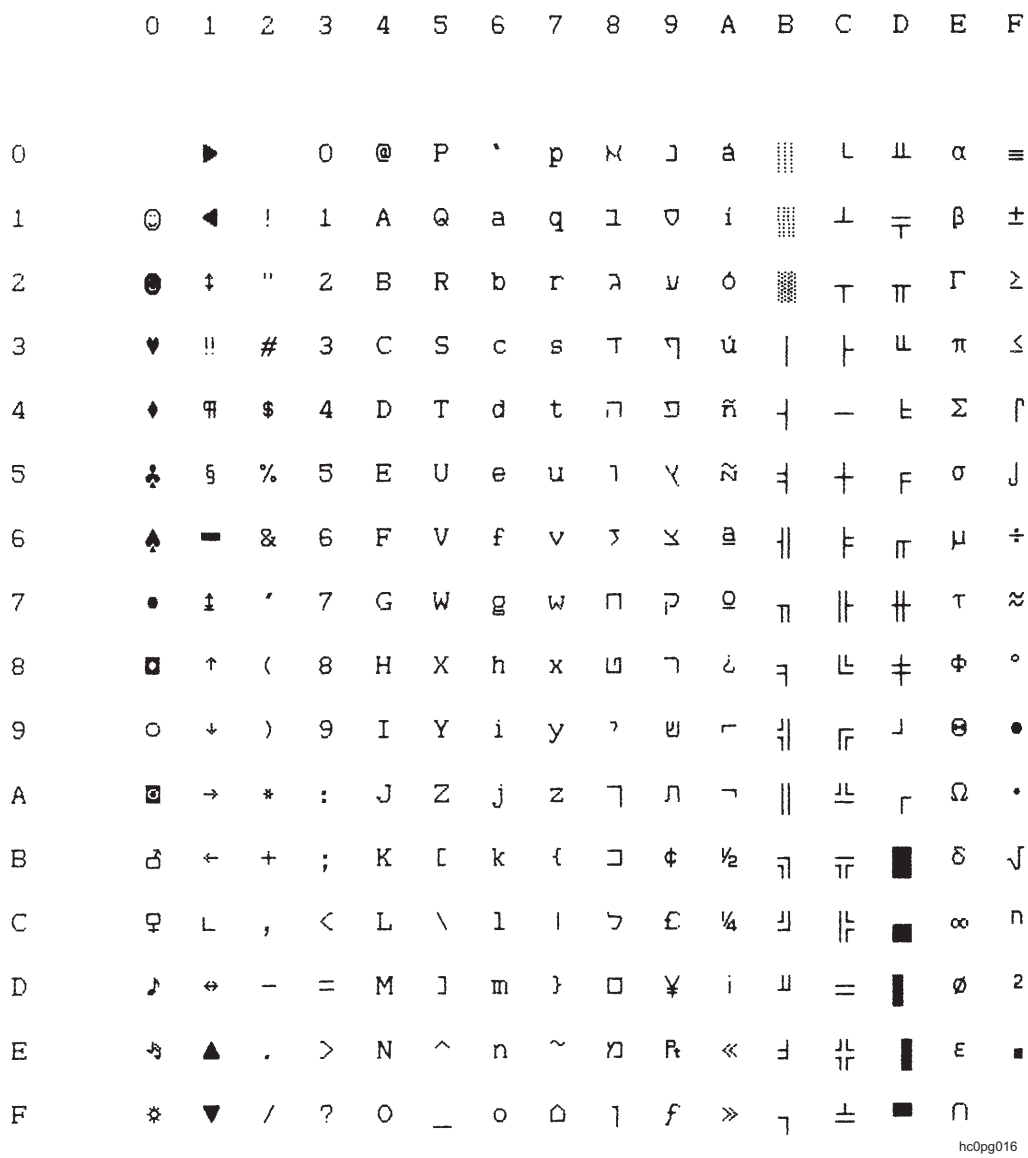

Figure 15. Hebrew (CP 862)

Canada/France (CP 863)

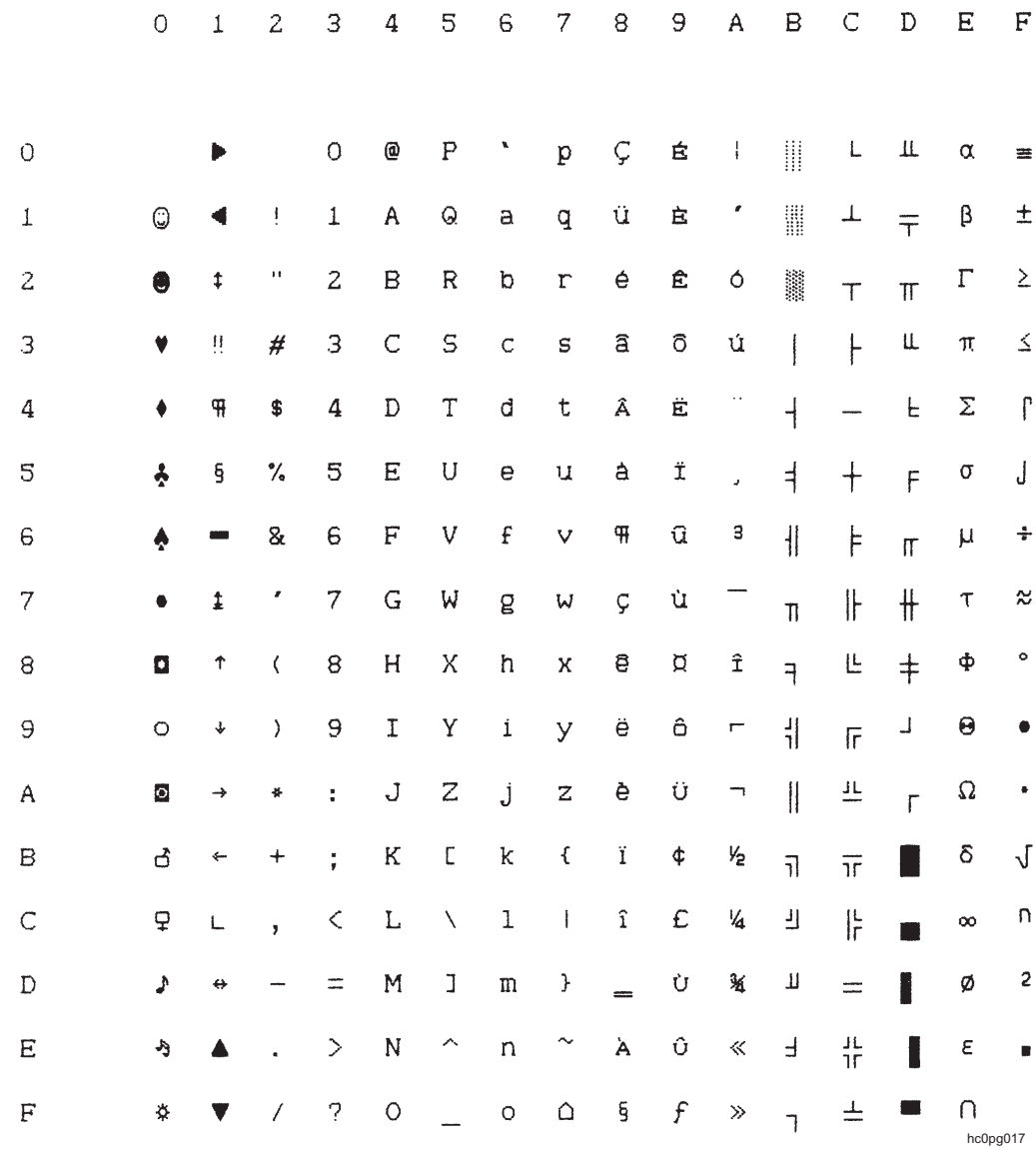

Figure 16. Canada/France (CP 863)

Arabic (CP 864)

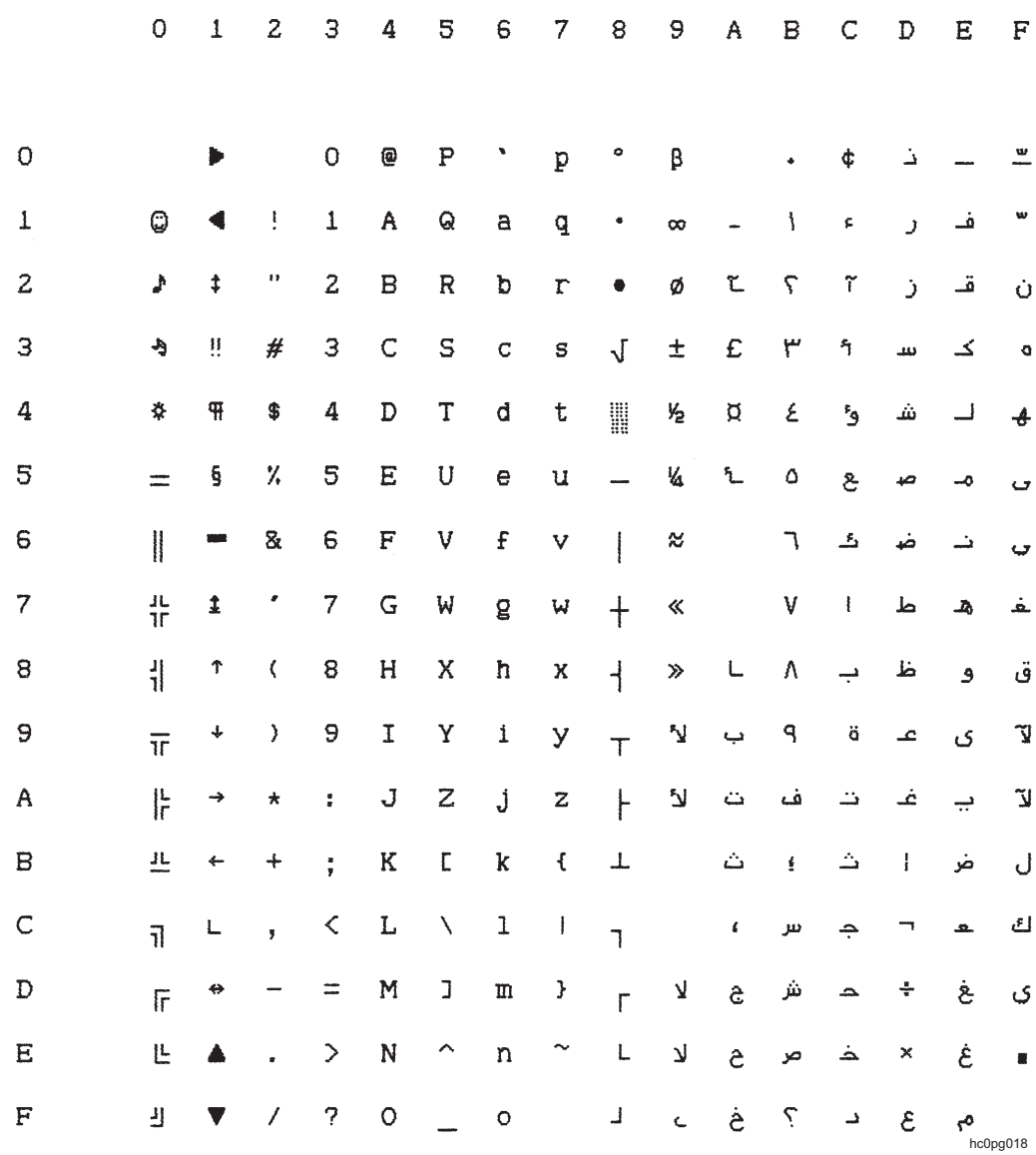

Figure 17. Arabic (CP 864)

CP 864E (Arabic)

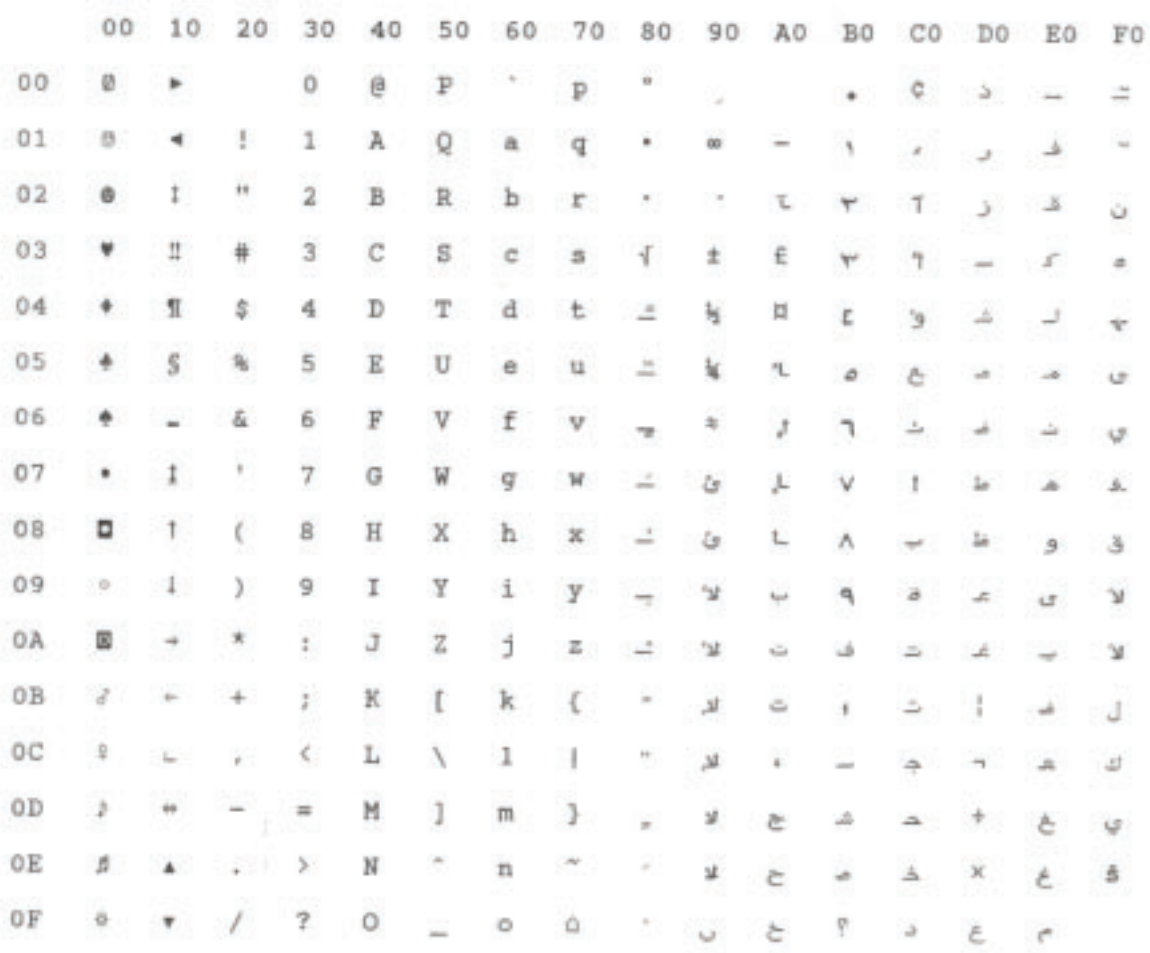

Figure 18. CP 864E (Arabic)

Denmark/Norway (CP 865)

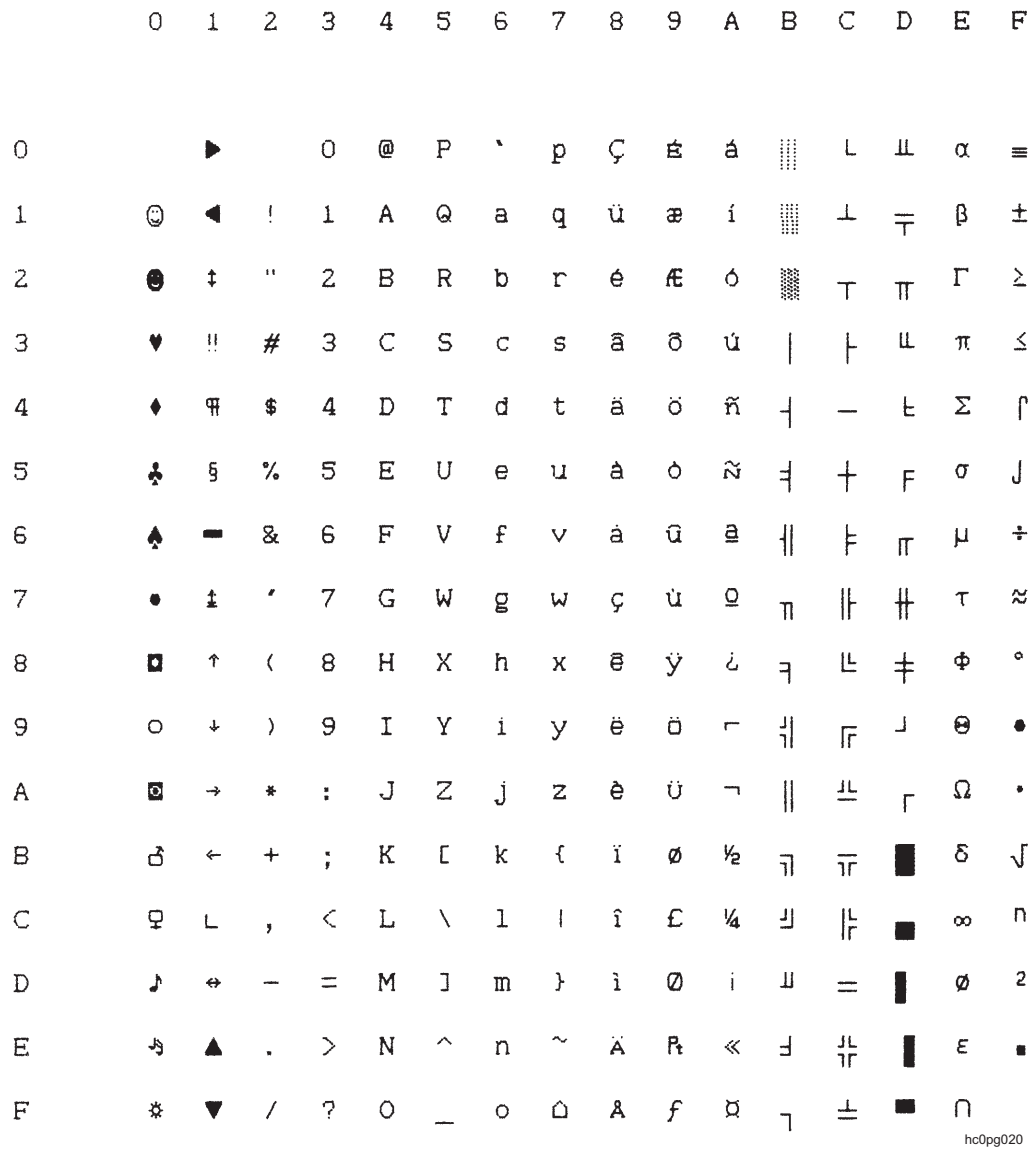

Figure 19. Denmark/Norway (CP 865)

Russian (CP 866)

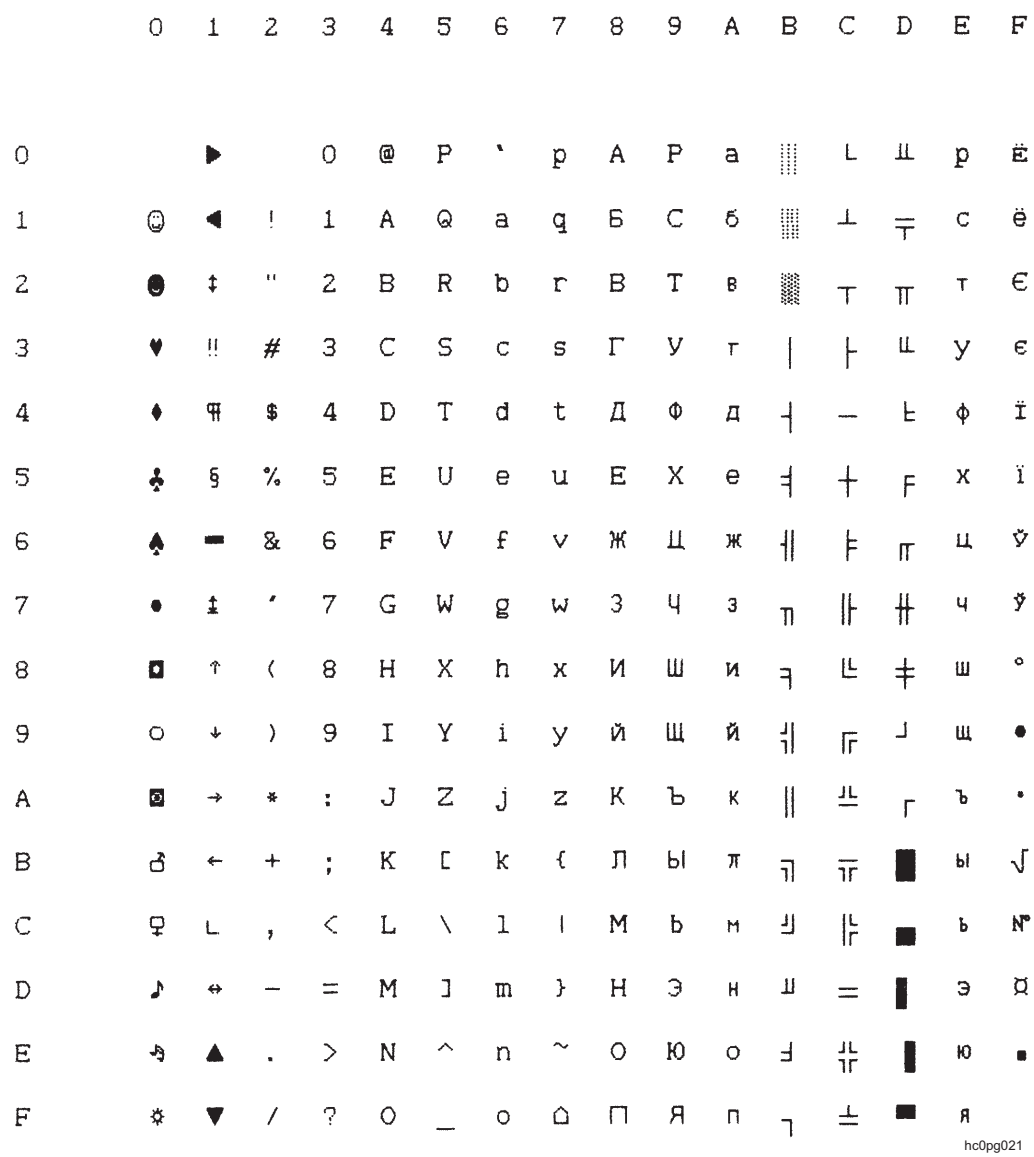

Figure 20. Russian (CP 866)

Turkish 2 (CP 867)

Figure 21. Turkish 2 (CP 867)

OCR-A (CP 876)

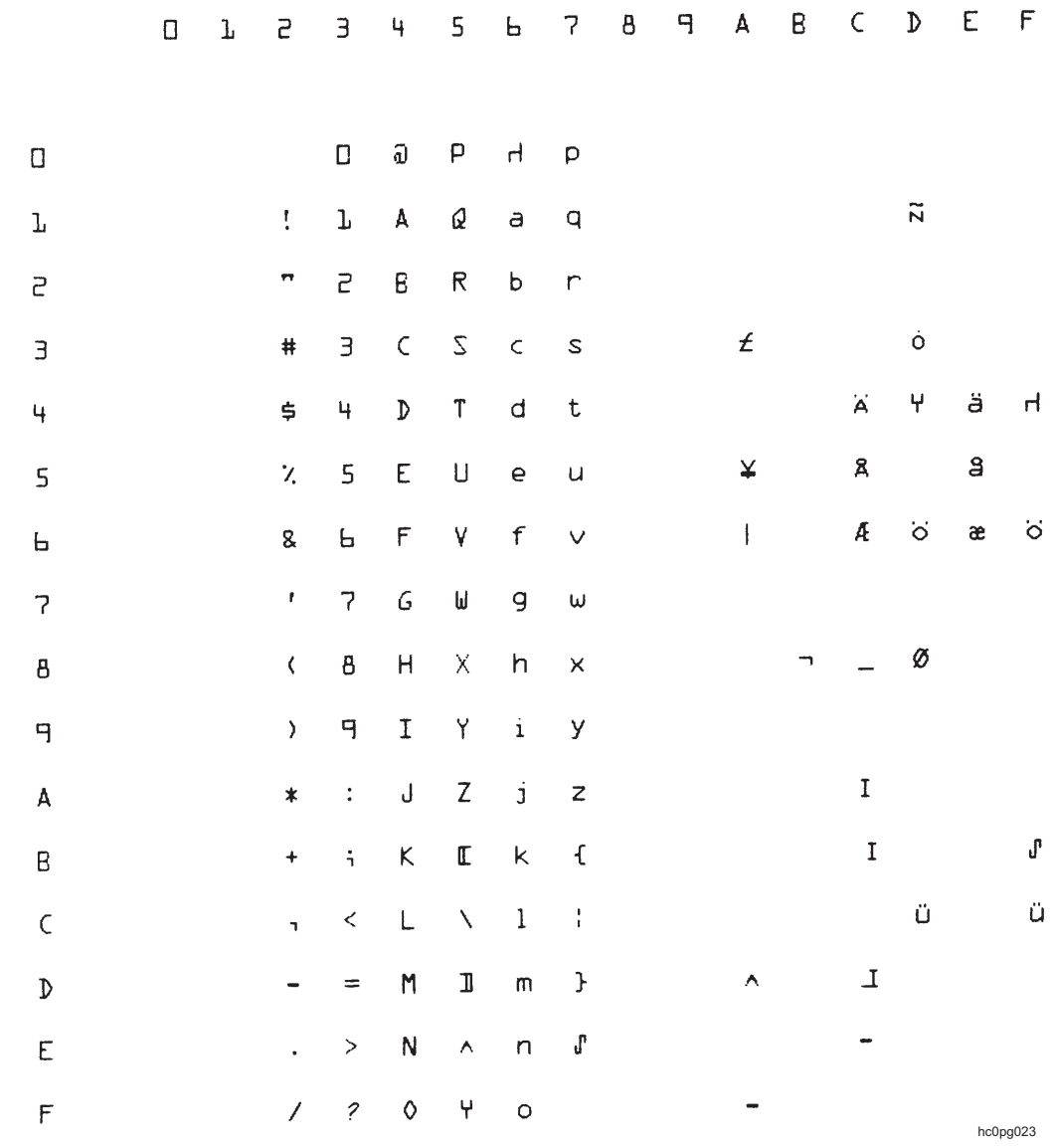

Figure 22. OCR-A (CP 876)

OCR-B (CP 877)

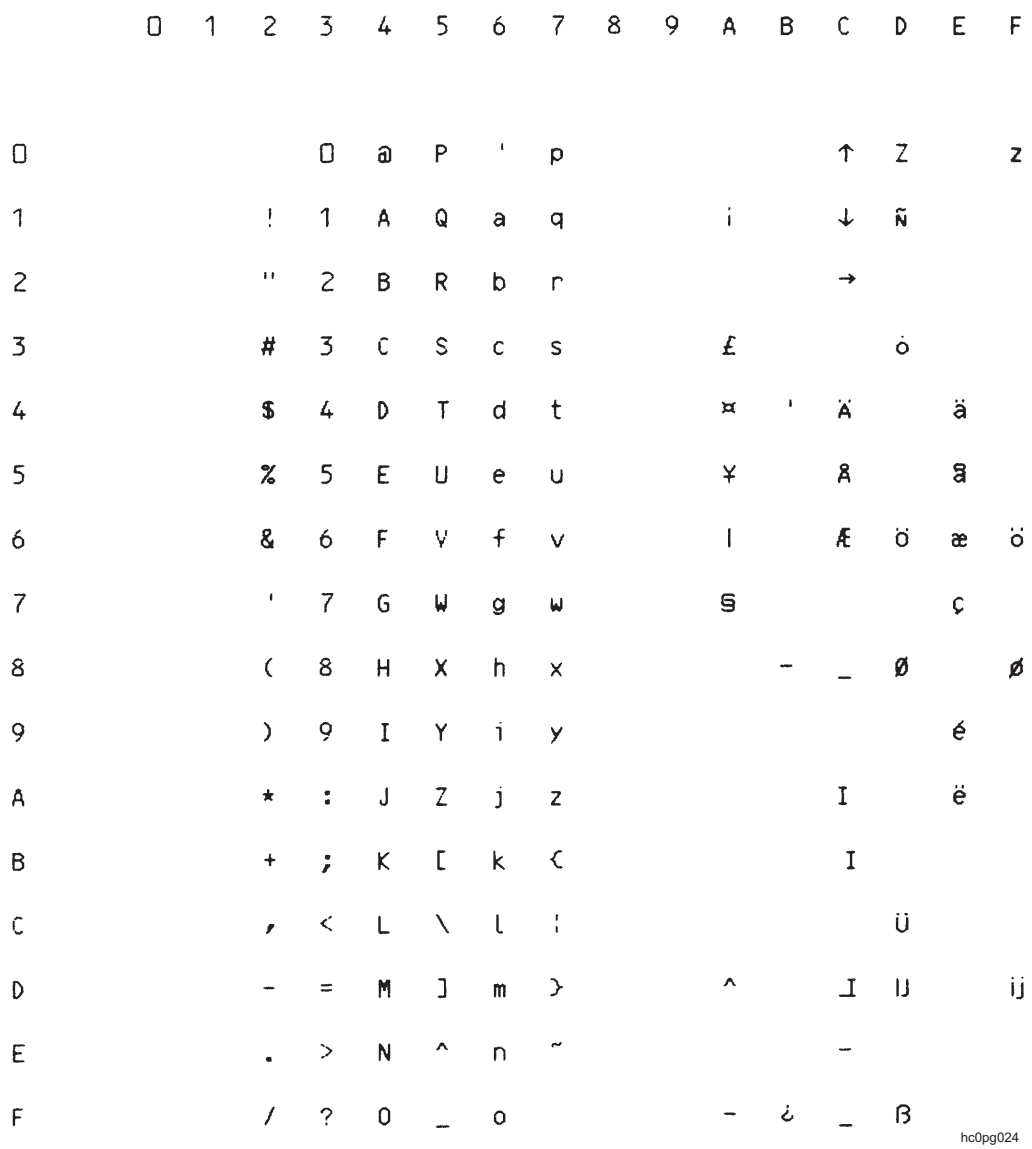

Figure 23. OCR-B (CP 877)

Farsi (CP 1098)

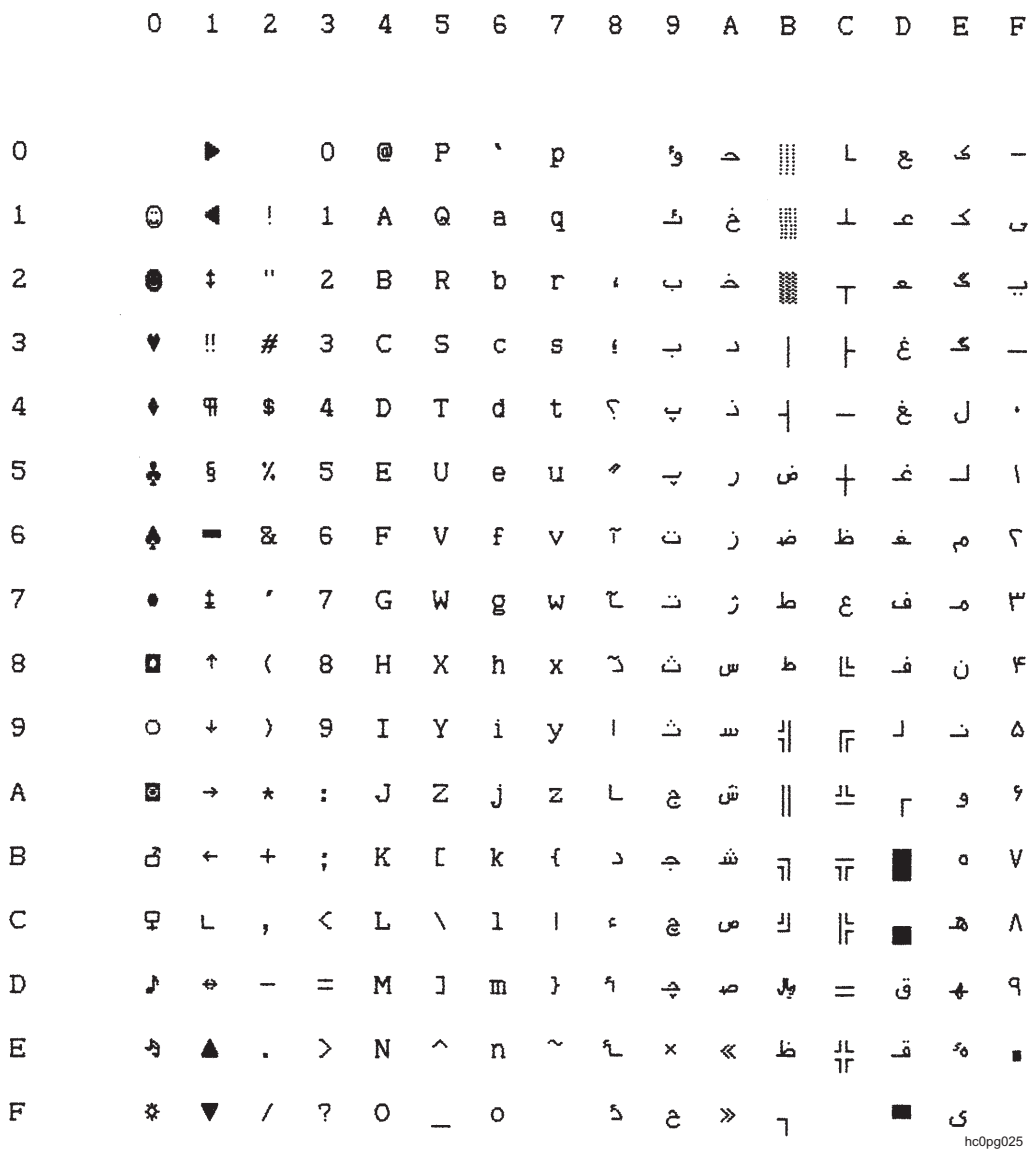

Figure 24. Farsi (CP 1098)

Central Europe (CP 1250)

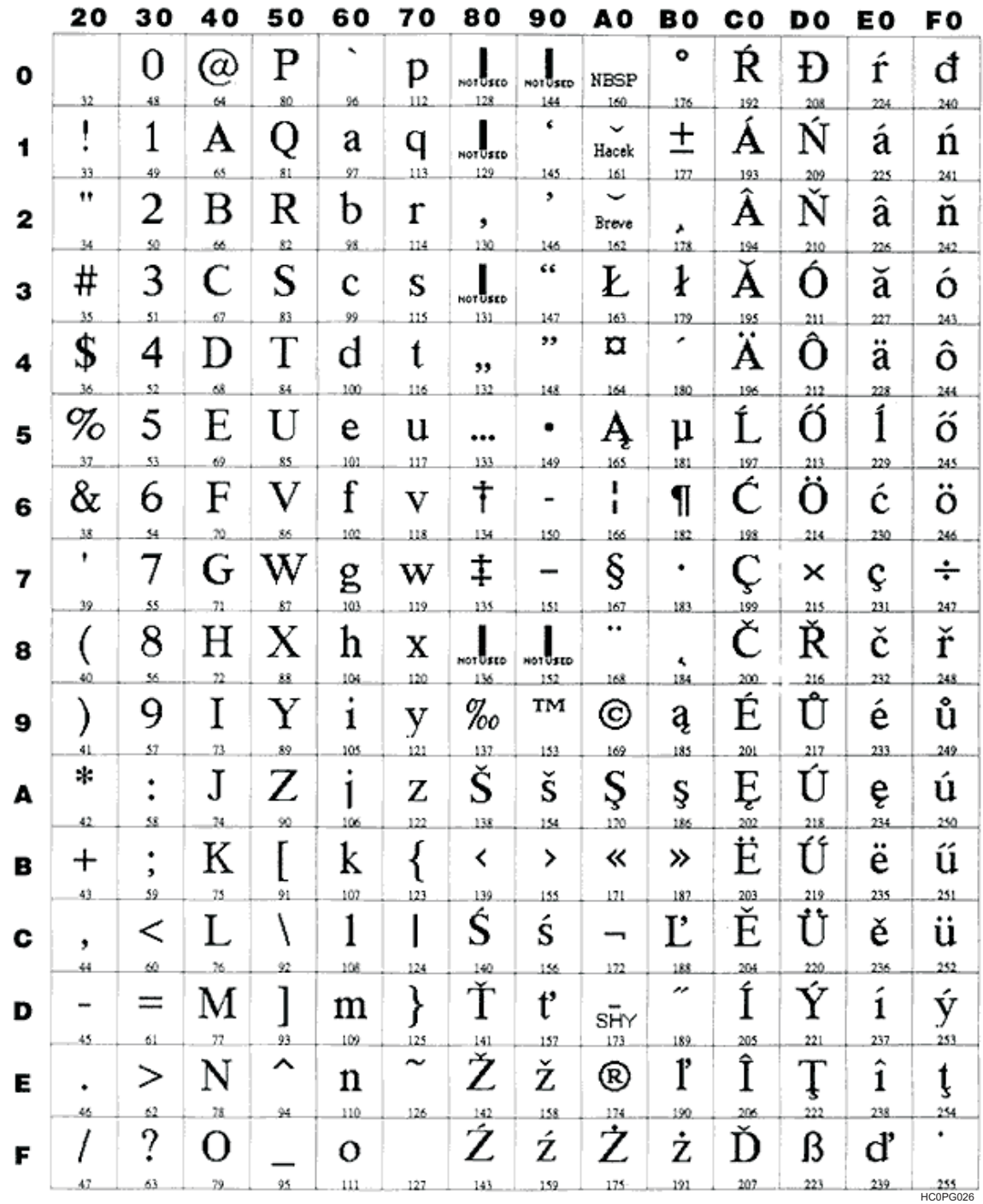

Figure 25. Central Europe (CP 1250)

Cyrillic (CP 1251)

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5	% 37	5 53	E 69	U 85	e 101	u 117	… 133	• 149	Ґ 165	µ 181	Е 197	Х 213	е 229	х 245
6	& 38	6 54	F 70	V 86	f 102	v 118	† 134	- 150	¦ 166	¶ 182	Ж 198	Ц 214	ж 230	ц 246
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Figure 26. Cyrillic (CP 1251)

Latin1 Ansi Windows (CP 1252)

Figure 27. Latin1 Ansi Windows (CP 1252)

Greek Windows (CP 1253)

Figure 28. Greek Windows (CP 1253)

Turkish Windows (CP 1254)

Figure 29. Turkish Windows (CP 1254)

Hebrew Windows (CP 1255)

Figure 30. Hebrew Windows (CP 1255)

Arabic Windows (CP 1256)

Figure 31. Arabic Windows (CP 1256)

Baltic Windows (CP 1257)

Figure 32. Baltic Windows (CP 1257)

MAZOWIA (Polish)

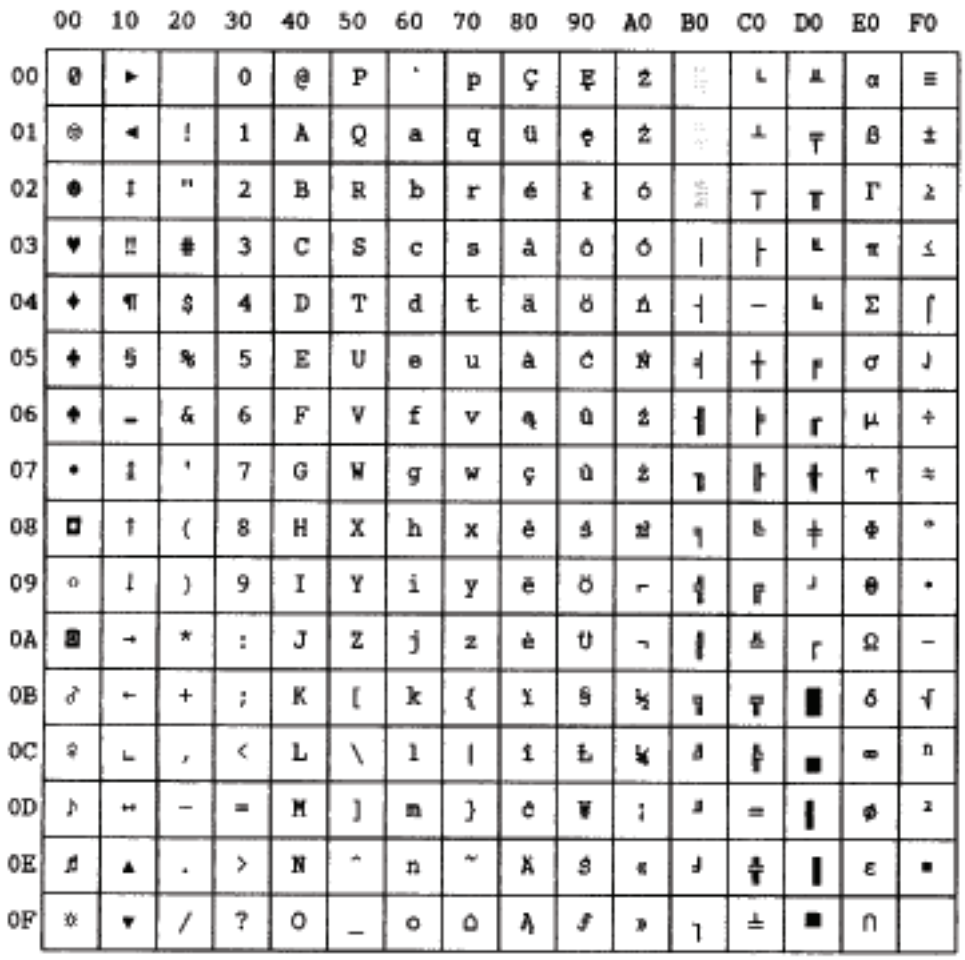

Figure 33. MAZOWIA (Polish)

GOST (Russian)

Figure 34. GOST (Russian)

TASS (Cyrillic)

Figure 35. TASS (Cyrillic)

UKRANIAN (old version)

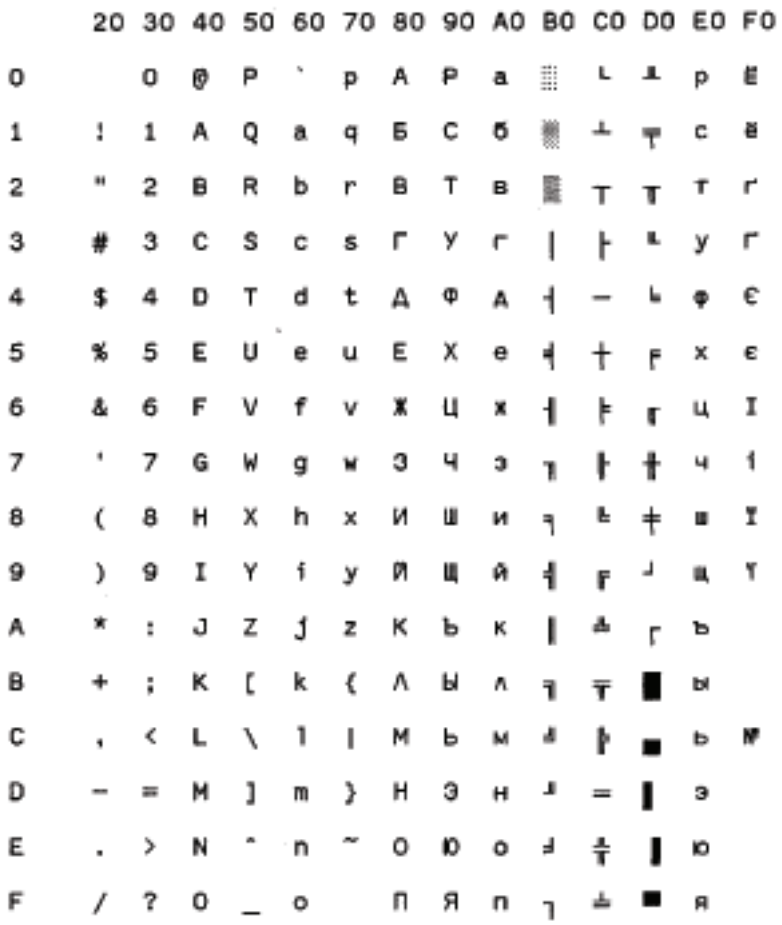

Figure 36. UKRANIAN (old version)

KOI8-U (new version)

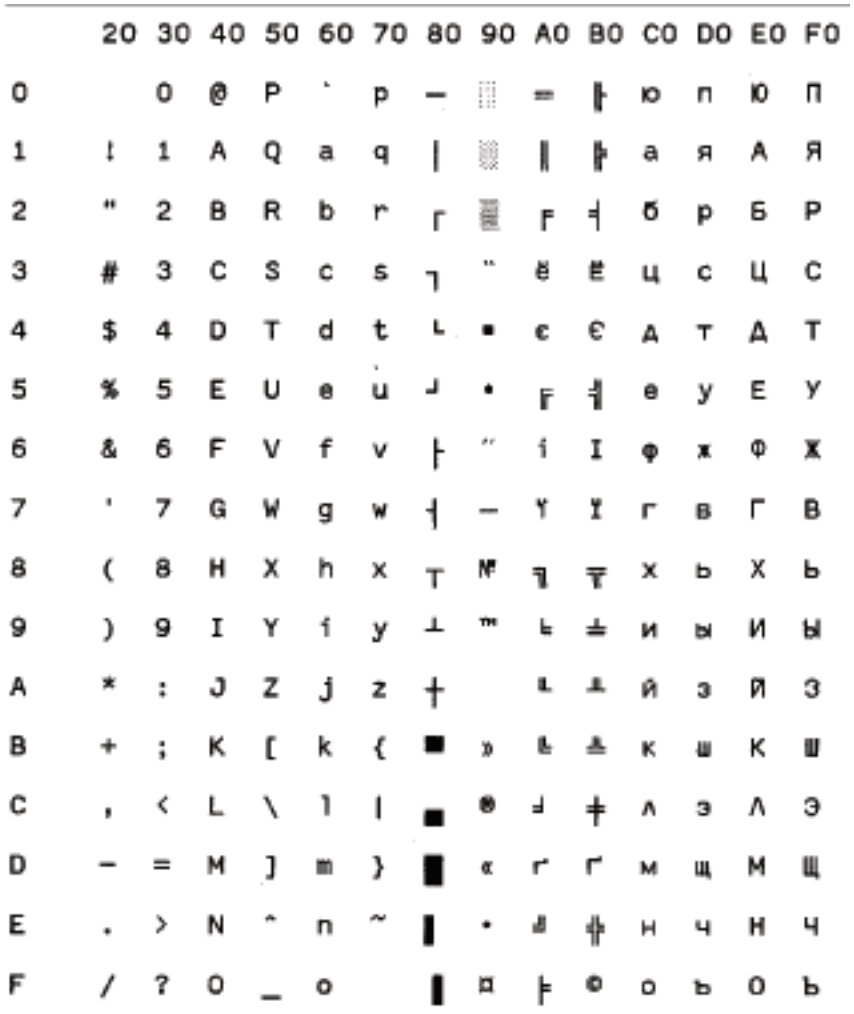

Figure 37. KOI8-U (new version)

Kamenicky

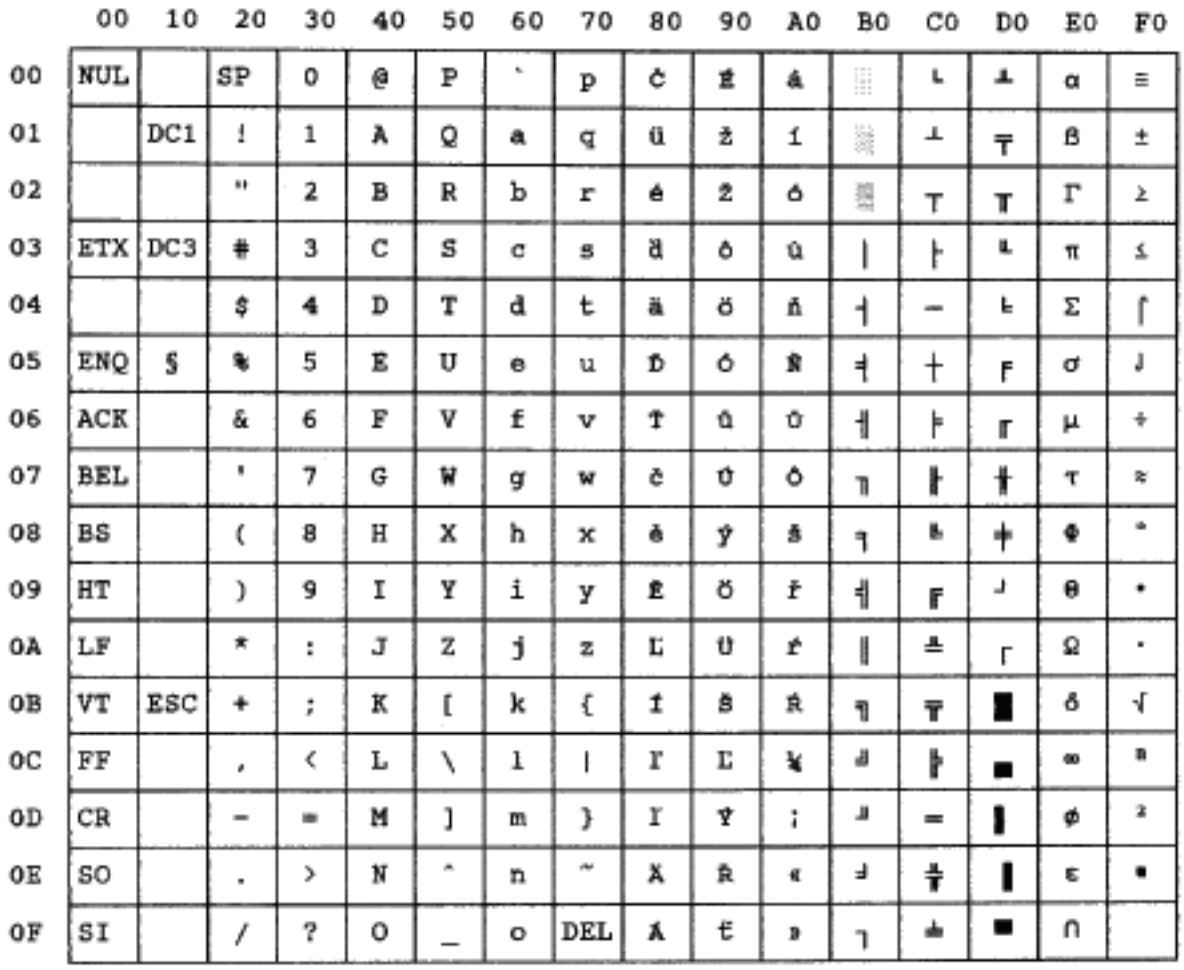

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Figure 38. Kamenicky

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Figure 39. CWI

Roman-8

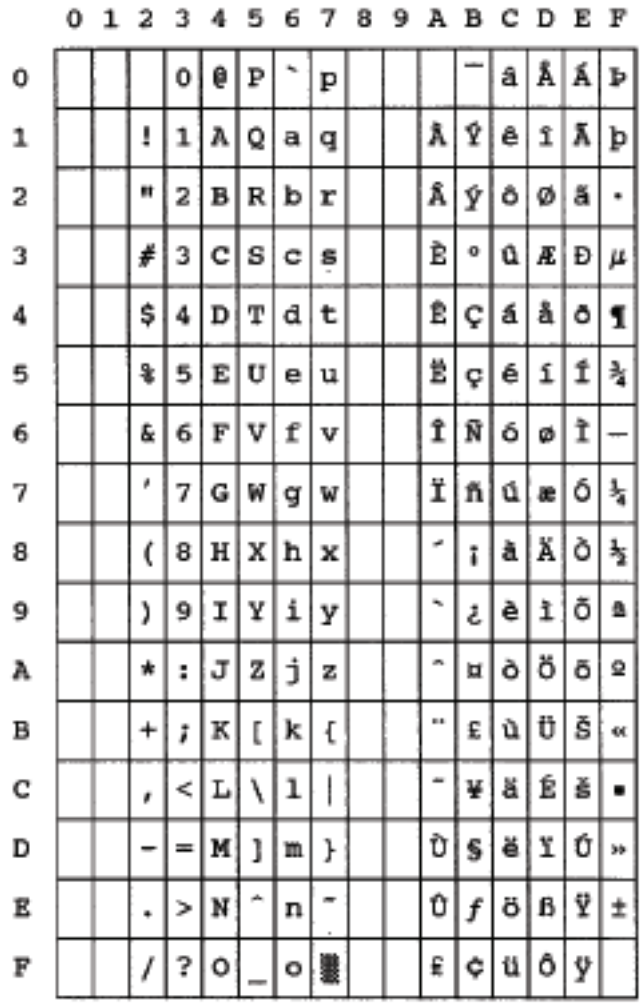

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Figure 40. Roman-8

IN2

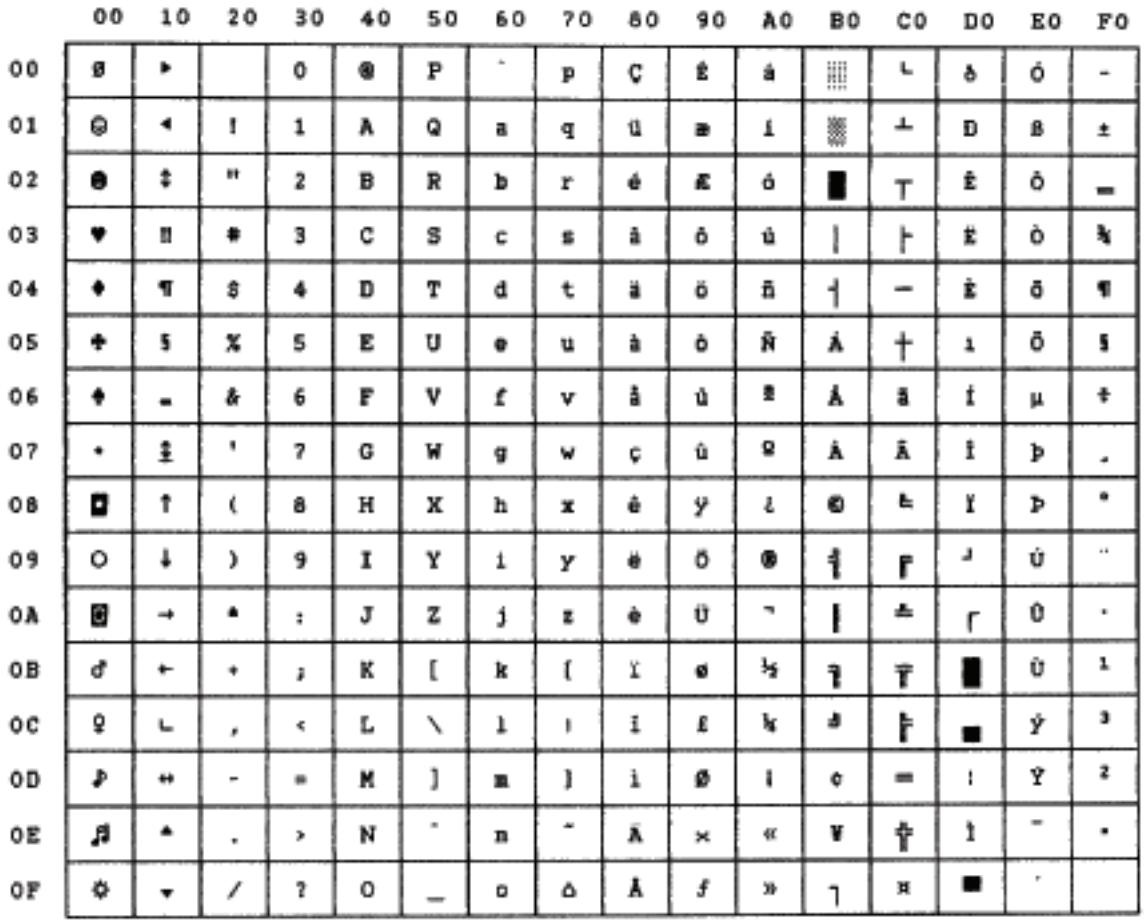

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Figure 41. IN2

Turkish

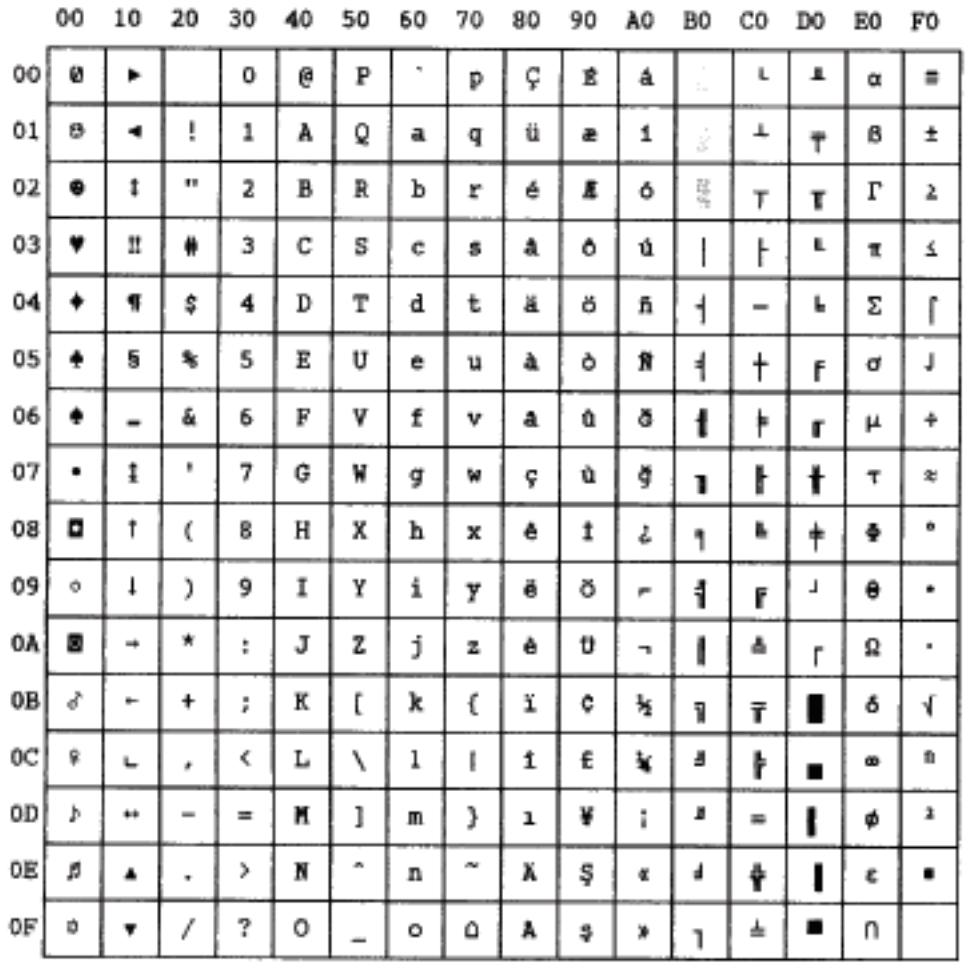


Figure 42. Turkish

ISO 8859/1 (Latin 1)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	NUL 0000	STX 0001	SOT 0002	ETX 0003	EOT 0004	ENQ 0005	ACK 0006	BEL 0007	BS 0008	HT 0009	LF 000A	VT 000B	FF 000C	CR 000D	SO 000E	SI 000F
10	DLE 0010	DC1 0011	DC2 0012	DC3 0013	DC4 0014	NAK 0015	SYN 0016	ETB 0017	CAN 0018	EM 0019	SUB 001A	ESC 001B	FS 001C	GS 001D	RS 001E	US 001F
20	SP 0020	! 0021	" 0022	# 0023	$ 0024	% 0025	& 0026	' 0027	(0028	) 0029	* 002A	+ 002B	, 002C	- 002D	. 002E	/ 002F
30	0 0030	1 0031	2 0032	3 0033	4 0034	5 0035	6 0036	7 0037	8 0038	9 0039	: 003A	; 003B	< 003C	= 003D	> 003E	? 003F
40	@ 0040	A 0041	B 0042	C 0043	D 0044	E 0045	F 0046	G 0047	H 0048	I 0049	J 004A	K 004B	L 004C	M 004D	N 004E	O 004F
50	P 0050	Q 0051	R 0052	S 0053	T 0054	U 0055	V 0056	W 0057	X 0058	Y 0059	Z 005A	[005B	\ 005C	] 005D	^ 005E	_ 005F
60	` 0060	a 0061	b 0062	c 0063	d 0064	e 0065	f 0066	g 0067	h 0068	i 0069	j 006A	k 006B	l 006C	m 006D	n 006E	o 006F
70	p 0070	q 0071	r 0072	s 0073	t 0074	u 0075	v 0076	w 0077	x 0078	y 0079	z 007A	{ 007B	| 007C	} 007D	~ 007E	DEL 007F
80																
90																
A0	NBSP 00A0	¡ 00A1	¢ 00A2	£ 00A3	¤ 00A4	¥ 00A5	¦ 00A6	§ 00A7	¨ 00A8	© 00A9	ª 00AA	« 00AB	¬ 00AC	- 00AD	® 00AE	¯ 00AF
B0	° 00B0	± 00B1	² 00B2	³ 00B3	´ 00B4	µ 00B5	¶ 00B6	· 00B7	¸ 00B8	¹ 00B9	º 00BA	» 00BB	¼ 00BC	½ 00BD	¾ 00BE	¿ 00BF
C0	À 00C0	Á 00C1	Â 00C2	Ã 00C3	Ä 00C4	Å 00C5	Æ 00C6	Ç 00C7	È 00C8	É 00C9	Ê 00CA	Ë 00CB	Ì 00CC	Í 00CD	Î 00CE	Ï 00CF
D0	Ð 00D0	Ñ 00D1	Ò 00D2	Ó 00D3	Ô 00D4	Õ 00D5	Ö 00D6	× 00D7	Ø 00D8	Ù 00D9	Ú 00DA	Û 00DB	Ü 00DC	Ý 00DD	Þ 00DE	ß 00DF
E0	à 00E0	á 00E1	â 00E2	ã 00E3	ä 00E4	å 00E5	æ 00E6	ç 00E7	è 00E8	é 00E9	ê 00EA	ë 00EB	ì 00EC	í 00ED	î 00EE	ï 00EF
F0	ð 00F0	ñ 00F1	ò 00F2	ó 00F3	ô 00F4	õ 00F5	ö 00F6	÷ 00F7	ø 00F8	ù 00F9	ú 00FA	û 00FB	ü 00FC	ý 00FD	þ 00FE	ÿ 00FF

HC0PG044

Figure 43. ISO 8859/1 (Latin 1)

ISO 8859/2 (Latin 2)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	NUL 0000	STX 0001	SOT 0002	ETX 0003	EOT 0004	ENQ 0005	ACK 0006	BEL 0007	BS 0008	HT 0009	LF 000A	VT 000B	FF 000C	CR 000D	SO 000E	SI 000F
10	DLE 0010	DC1 0011	DC2 0012	DC3 0013	DC4 0014	NAK 0015	SYN 0016	ETB 0017	CAN 0018	EM 0019	SUB 001A	ESC 001B	FS 001C	GS 001D	RS 001E	US 001F
20	SP 0020	! 0021	" 0022	# 0023	$ 0024	% 0025	& 0026	' 0027	(0028	) 0029	* 002A	+ 002B	, 002C	- 002D	. 002E	/ 002F
30	0 0030	1 0031	2 0032	3 0033	4 0034	5 0035	6 0036	7 0037	8 0038	9 0039	: 003A	; 003B	< 003C	= 003D	> 003E	? 003F
40	@ 0040	A 0041	B 0042	C 0043	D 0044	E 0045	F 0046	G 0047	H 0048	I 0049	J 004A	K 004B	L 004C	M 004D	N 004E	O 004F
50	P 0050	Q 0051	R 0052	S 0053	T 0054	U 0055	V 0056	W 0057	X 0058	Y 0059	Z 005A	[005B	\ 005C	] 005D	^ 005E	_ 005F
60	` 0060	a 0061	b 0062	c 0063	d 0064	e 0065	f 0066	g 0067	h 0068	i 0069	j 006A	k 006B	l 006C	m 006D	n 006E	o 006F
70	p 0070	q 0071	r 0072	s 0073	t 0074	u 0075	v 0076	w 0077	x 0078	y 0079	z 007A	{ 007B	| 007C	} 007D	~ 007E	DEL 007F
80																
90																
A0	NBSP 00A0	Ą 0104	˘ 02D8	Ł 0141	¤ 00A4	Ľ 013D	Ś 015A	§ 00A7	¨ 00A8	Š 0160	Ş 015E	Ť 0164	Ź 0179	- 00AD	Ž 017D	Ż 017B
B0	° 00B0	ą 0105	˛ 02DB	ł 0142	´ 00B4	ľ 013E	ś 015B	ˇ 02C7	¸ 00B8	š 0161	ş 015F	ť 0165	ź 017A	˝ 02DD	ž 017E	ż 017C
C0	Ŕ 0154	Á 00C1	Â 00C2	Ă 0102	Ä 00C4	Ĺ 0139	Ć 0106	Ç 00C7	Č 010C	É 00C9	Ę 0118	Ë 00CB	Ě 011A	Í 00CD	Î 00CE	Ď 010E
D0	Đ 0110	Ń 0143	Ň 0147	Ó 00D3	Ô 00D4	Ő 0150	Ö 00D6	× 00D7	Ř 0158	Ů 016E	Ú 00DA	Ű 0170	Ü 00DC	Ý 00DD	Ţ 0162	ß 00DF
E0	ŕ 0155	á 00E1	â 00E2	ă 0103	ä 00E4	ĺ 013A	ć 0107	ç 00E7	č 010D	é 00E9	ę 0119	ë 00EB	ě 011B	í 00ED	î 00EE	ď 010F
F0	đ 0111	ń 0144	ň 0148	ó 00F3	ô 00F4	ő 0151	ö 00F6	÷ 00F7	ř 0159	ů 016F	ú 00FA	ű 0171	ü 00FC	ý 00FD	ţ 0163	˙ 02D9

HC0PG045

Figure 44. ISO 8859/2 (Latin 2)

ISO 8859/3 (Latin 3)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	NUL 0000	STX 0001	SOT 0002	ETX 0003	EOT 0004	ENQ 0005	ACK 0006	BEL 0007	BS 0008	HT 0009	LF 000A	VT 000B	FF 000C	CR 000D	SO 000E	SI 000F
10	DLE 0010	DC1 0011	DC2 0012	DC3 0013	DC4 0014	NAK 0015	SYN 0016	ETB 0017	CAN 0018	EM 0019	SUB 001A	ESC 001B	FS 001C	GS 001D	RS 001E	US 001F
20	SP 0020	! 0021	" 0022	# 0023	$ 0024	% 0025	& 0026	' 0027	(0028	) 0029	* 002A	+ 002B	, 002C	- 002D	. 002E	/ 002F
30	0 0030	1 0031	2 0032	3 0033	4 0034	5 0035	6 0036	7 0037	8 0038	9 0039	: 003A	; 003B	< 003C	= 003D	> 003E	? 003F
40	@ 0040	A 0041	B 0042	C 0043	D 0044	E 0045	F 0046	G 0047	H 0048	I 0049	J 004A	K 004B	L 004C	M 004D	N 004E	O 004F
50	P 0050	Q 0051	R 0052	S 0053	T 0054	U 0055	V 0056	W 0057	X 0058	Y 0059	Z 005A	[005B	\ 005C	] 005D	^ 005E	_ 005F
60	` 0060	a 0061	b 0062	c 0063	d 0064	e 0065	f 0066	g 0067	h 0068	i 0069	j 006A	k 006B	l 006C	m 006D	n 006E	o 006F
70	p 0070	q 0071	r 0072	s 0073	t 0074	u 0075	v 0076	w 0077	x 0078	y 0079	z 007A	{ 007B	| 007C	} 007D	~ 007E	DEL 007F
80																
90																
A0	NBSP 00A0	Ħ 0126	˘ 02D8	£ 00A3	¤ 00A4		Ĥ 0124	§ 00A7	¨ 00A8	İ 0130	Ş 015E	Ğ 011E	Ĵ 0134	- 00AD		Ż 017B
B0	° 00B0	ħ 0127	² 00B2	³ 00B3	´ 00B4	µ 00B5	ĥ 0125	· 00B7	¸ 00B8	ı 0131	ş 015F	ğ 011F	ĵ 0135	½ 00BD		ż 017C
C0	À 00C0	Á 00C1	Â 00C2		Ä 00C4	Ċ 010A	Ĉ 0108	Ç 00C7	È 00C8	É 00C9	Ê 00CA	Ë 00CB	Ì 00CC	Í 00CD	Î 00CE	Ï 00CF
D0		Ñ 00D1	Ò 00D2	Ó 00D3	Ô 00D4	Ġ 0120	Ö 00D6	× 00D7	Ĝ 011C	Ù 00D9	Ú 00DA	Û 00DB	Ü 00DC	Ŭ 016C	Ŝ 015C	ß 00DF
E0	à 00E0	á 00E1	â 00E2		ä 00E4	ċ 010B	ĉ 0109	ç 00E7	è 00E8	é 00E9	ê 00EA	ë 00EB	ì 00EC	í 00ED	î 00EE	ï 00EF
F0		ñ 00F1	ò 00F2	ó 00F3	ô 00F4	ġ 0121	ö 00F6	÷ 00F7	ĝ 011D	ù 00F9	ú 00FA	û 00FB	ü 00FC	ŭ 016D	ŝ 015D	˙ 02D9

HC0PG046

Figure 45. ISO 8859/3 (Latin 3)

ISO 8859/4 (Latin 4)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	NUL 0000	STX 0001	SOT 0002	ETX 0003	EOT 0004	ENQ 0005	ACK 0006	BEL 0007	BS 0008	HT 0009	LF 000A	VT 000B	FF 000C	CR 000D	SO 000E	SI 000F
10	DLE 0010	DC1 0011	DC2 0012	DC3 0013	DC4 0014	NAK 0015	SYN 0016	ETB 0017	CAN 0018	EM 0019	SUB 001A	ESC 001B	FS 001C	GS 001D	RS 001E	US 001F
20	SP 0020	! 0021	" 0022	# 0023	$ 0024	% 0025	& 0026	' 0027	(0028	) 0029	* 002A	+ 002B	, 002C	- 002D	. 002E	/ 002F
30	0 0030	1 0031	2 0032	3 0033	4 0034	5 0035	6 0036	7 0037	8 0038	9 0039	: 003A	; 003B	< 003C	= 003D	> 003E	? 003F
40	@ 0040	A 0041	B 0042	C 0043	D 0044	E 0045	F 0046	G 0047	H 0048	I 0049	J 004A	K 004B	L 004C	M 004D	N 004E	O 004F
50	P 0050	Q 0051	R 0052	S 0053	T 0054	U 0055	V 0056	W 0057	X 0058	Y 0059	Z 005A	[005B	\ 005C	] 005D	^ 005E	_ 005F
60	` 0060	a 0061	b 0062	c 0063	d 0064	e 0065	f 0066	g 0067	h 0068	i 0069	j 006A	k 006B	l 006C	m 006D	n 006E	o 006F
70	p 0070	q 0071	r 0072	s 0073	t 0074	u 0075	v 0076	w 0077	x 0078	y 0079	z 007A	{ 007B	| 007C	} 007D	~ 007E	DEL 007F
80																
90																
A0	NBSP 00A0	Ą 0104	ĸ 0138	Ŗ 0156	¤ 00A4	Ĩ 0128	Ļ 013B	§ 00A7	¨ 00A8	Š 0160	Ē 0112	Ģ 0122	Ŧ 0166	- 00AD	Ž 017D	¯ 00AF
B0	° 00B0	ą 0105	˛ 02DB	ŗ 0157	´ 00B4	ĩ 0129	ļ 013C	ˇ 02C7	¸ 00B8	š 0161	ē 0113	ģ 0123	ŧ 0167	Ŋ 014A	ž 017E	ŋ 014B
C0	Ā 0100	Á 00C1	Â 00C2	Ã 00C3	Ä 00C4	Å 00C5	Æ 00C6	Į 012E	Č 010C	É 00C9	Ę 0118	Ë 00CB	Ė 0116	Í 00CD	Î 00CE	Ī 012A
D0	Đ 0110	Ņ 0145	Ō 014C	Ķ 0136	Ô 00D4	Õ 00D5	Ö 00D6	× 00D7	Ø 00D8	Ų 0172	Ú 00DA	Û 00DB	Ü 00DC	Ũ 0168	Ū 016A	ß 00DF
E0	ā 0101	á 00E1	â 00E2	ã 00E3	ä 00E4	å 00E5	æ 00E6	į 012F	č 010D	é 00E9	ę 0119	ë 00EB	ė 0117	í 00ED	î 00EE	ī 012B
F0	đ 0111	ņ 0146	ō 014D	ķ 0137	ô 00F4	õ 00F5	ö 00F6	÷ 00F7	ø 00F8	ų 0173	ú 00FA	û 00FB	ü 00FC	ũ 0169	ū 016B	˙ 02D9

HC0PG047

Figure 46. ISO 8859/4 (Latin 4)

ISO 8859/5 (Latin/Cyrillic)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	NUL 0000	STX 0001	SOT 0002	ETX 0003	EOT 0004	ENQ 0005	ACK 0006	BEL 0007	BS 0008	HT 0009	LF 000A	VT 000B	FF 000C	CR 000D	SO 000E	SI 000F
10	DLE 0010	DC1 0011	DC2 0012	DC3 0013	DC4 0014	NAK 0015	SYN 0016	ETB 0017	CAN 0018	EM 0019	SUB 001A	ESC 001B	FS 001C	GS 001D	RS 001E	US 001F
20	SP 0020	! 0021	" 0022	# 0023	$ 0024	% 0025	& 0026	' 0027	(0028	) 0029	* 002A	+ 002B	, 002C	- 002D	. 002E	/ 002F
30	0 0030	1 0031	2 0032	3 0033	4 0034	5 0035	6 0036	7 0037	8 0038	9 0039	: 003A	; 003B	< 003C	= 003D	> 003E	? 003F
40	@ 0040	A 0041	B 0042	C 0043	D 0044	E 0045	F 0046	G 0047	H 0048	I 0049	J 004A	K 004B	L 004C	M 004D	N 004E	O 004F
50	P 0050	Q 0051	R 0052	S 0053	T 0054	U 0055	V 0056	W 0057	X 0058	Y 0059	Z 005A	[005B	\ 005C	] 005D	^ 005E	_ 005F
60	` 0060	a 0061	b 0062	c 0063	d 0064	e 0065	f 0066	g 0067	h 0068	i 0069	j 006A	k 006B	l 006C	m 006D	n 006E	o 006F
70	p 0070	q 0071	r 0072	s 0073	t 0074	u 0075	v 0076	w 0077	x 0078	y 0079	z 007A	{ 007B	| 007C	} 007D	~ 007E	DEL 007F
80																
90																
A0	NBSP 00A0	Ё 0401	Ђ 0402	Ѓ 0403	Є 0404	S 0405	I 0406	Ї 0407	J 0408	Љ 0409	Њ 040A	Ћ 040B	Ќ 040C	- 00AD	Ў 040E	Џ 040F
B0	А 0410	Б 0411	В 0412	Г 0413	Д 0414	Е 0415	Ж 0416	З 0417	И 0418	Й 0419	К 041A	Л 041B	М 041C	Н 041D	О 041E	П 041F
C0	Р 0420	С 0421	Т 0422	У 0423	Ф 0424	Х 0425	Ц 0426	Ч 0427	Ш 0428	Щ 0429	Ъ 042A	Ы 042B	Ь 042C	Э 042D	Ю 042E	Я 042F
D0	а 0430	б 0431	в 0432	г 0433	д 0434	е 0435	ж 0436	з 0437	и 0438	й 0439	к 043A	л 043B	м 043C	н 043D	о 043E	п 043F
E0	р 0440	с 0441	т 0442	у 0443	ф 0444	х 0445	ц 0446	ч 0447	ш 0448	щ 0449	ъ 044A	ы 044B	ь 044C	э 044D	ю 044E	я 044F
F0	№ 2116	ё 0451	ђ 0452	ѓ 0453	є 0454	s 0455	і 0456	ї 0457	j 0458	љ 0459	њ 045A	ћ 045B	ќ 045C	§ 00A7	ў 045E	џ 045F

HC0PG048

Figure 47. ISO 8859/5 (Latin/Cyrillic)

ISO 8859/6 (Latin/Arabic)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	NUL 0000	STX 0001	SOT 0002	ETX 0003	EOT 0004	ENQ 0005	ACK 0006	BEL 0007	BS 0008	HT 0009	LF 000A	VT 000B	FF 000C	CR 000D	SO 000E	SI 000F
10	DLE 0010	DC1 0011	DC2 0012	DC3 0013	DC4 0014	NAK 0015	SYN 0016	ETB 0017	CAN 0018	EM 0019	SUB 001A	ESC 001B	FS 001C	GS 001D	RS 001E	US 001F
20	SP 0020	! 0021	" 0022	# 0023	$ 0024	% 0025	& 0026	' 0027	(0028	) 0029	* 002A	+ 002B	, 002C	- 002D	. 002E	/ 002F
30	0 0030	1 0031	2 0032	3 0033	4 0034	5 0035	6 0036	7 0037	8 0038	9 0039	: 003A	; 003B	< 003C	= 003D	> 003E	? 003F
40	@ 0040	A 0041	B 0042	C 0043	D 0044	E 0045	F 0046	G 0047	H 0048	I 0049	J 004A	K 004B	L 004C	M 004D	N 004E	O 004F
50	P 0050	Q 0051	R 0052	S 0053	T 0054	U 0055	V 0056	W 0057	X 0058	Y 0059	Z 005A	[005B	\ 005C	] 005D	^ 005E	_ 005F
60	` 0060	a 0061	b 0062	c 0063	d 0064	e 0065	f 0066	g 0067	h 0068	i 0069	j 006A	k 006B	l 006C	m 006D	n 006E	o 006F
70	p 0070	q 0071	r 0072	s 0073	t 0074	u 0075	v 0076	w 0077	x 0078	y 0079	z 007A	{ 007B	| 007C	} 007D	~ 007E	DEL 007F
80																
90																
A0	NBSP 00A0				¤ 00A4								، 060C	ـ 00AD		
B0												؛ 061B				؟ 061F
C0		ء 0621	آ 0622	أ 0623	ؤ 0624	إ 0625	ئ 0626	ا 0627	ب 0628	ة 0629	ت 062A	ث 062B	ج 062C	ح 062D	خ 062E	د 062F
D0	ذ 0630	ر 0631	ز 0632	س 0633	ش 0634	ص 0635	ض 0636	ط 0637	ظ 0638	ع 0639	غ 063A					
E0	ـ 0640	ف 0641	ق 0642	ك 0643	ل 0644	م 0645	ن 0646	ه 0647	و 0648	ى 0649	ي 064A	ً 064B	ٌ 064C	ٍ 064D	َ 064E	ُ 064F
F0	ِ 0650	ّ 0651	ْ 0652													

HC0PG049

Figure 48. ISO 8859/6 (Latin/Arabic)

ISO 8859/7 (Latin/Greek)

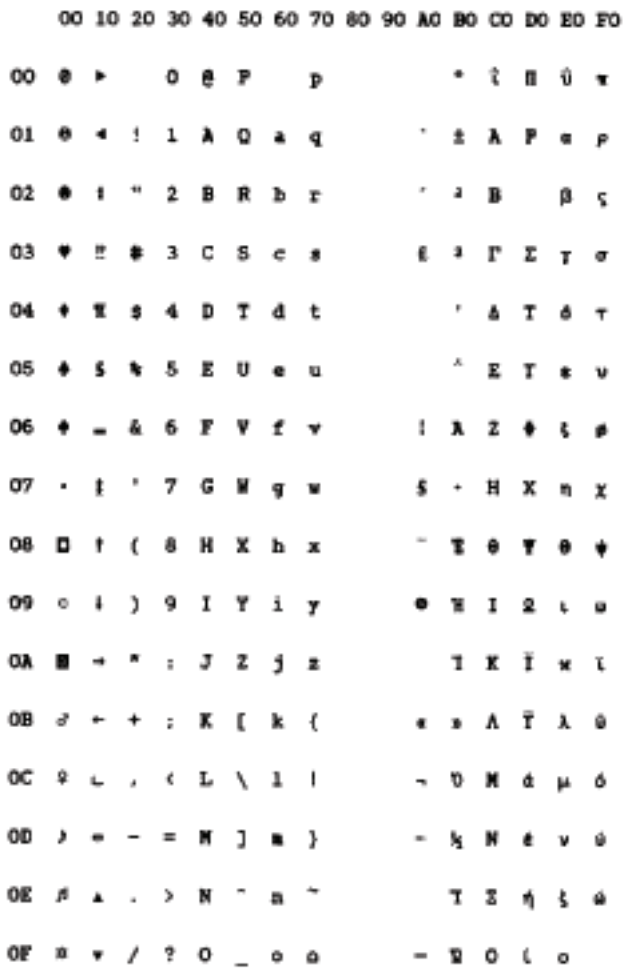


Figure 49. ISO 8859/7 (Latin/Greek)

ISO 8859/8 (Latin/Hebrew)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	NUL 0000	STX 0001	SOT 0002	ETX 0003	EOT 0004	ENQ 0005	ACK 0006	BEL 0007	BS 0008	HT 0009	LF 000A	VT 000B	FF 000C	CR 000D	SO 000E	SI 000F
10	DLE 0010	DC1 0011	DC2 0012	DC3 0013	DC4 0014	NAK 0015	SYN 0016	ETB 0017	CAN 0018	EM 0019	SUB 001A	ESC 001B	FS 001C	GS 001D	RS 001E	US 001F
20	SP 0020	! 0021	" 0022	# 0023	$ 0024	% 0025	& 0026	' 0027	(0028	) 0029	* 002A	+ 002B	, 002C	- 002D	. 002E	/ 002F
30	0 0030	1 0031	2 0032	3 0033	4 0034	5 0035	6 0036	7 0037	8 0038	9 0039	: 003A	; 003B	< 003C	= 003D	> 003E	? 003F
40	@ 0040	A 0041	B 0042	C 0043	D 0044	E 0045	F 0046	G 0047	H 0048	I 0049	J 004A	K 004B	L 004C	M 004D	N 004E	O 004F
50	P 0050	Q 0051	R 0052	S 0053	T 0054	U 0055	V 0056	W 0057	X 0058	Y 0059	Z 005A	[005B	\ 005C	] 005D	^ 005E	_ 005F
60	` 0060	a 0061	b 0062	c 0063	d 0064	e 0065	f 0066	g 0067	h 0068	i 0069	j 006A	k 006B	l 006C	m 006D	n 006E	o 006F
70	p 0070	q 0071	r 0072	s 0073	t 0074	u 0075	v 0076	w 0077	x 0078	y 0079	z 007A	{ 007B	| 007C	} 007D	~ 007E	DEL 007F
80																
90																
A0	NBSP 00A0		¢ 00A2	£ 00A3	¤ 00A4	¥ 00A5	¦ 00A6	§ 00A7	¨ 00A8	© 00A9	× 00D7	« 00AB	¬ 00AC	- 00AD	® 00AE	¯ 203E
B0	° 00B0	± 00B1	² 00B2	³ 00B3	´ 00B4	µ 00B5	¶ 00B6	· 00B7	¸ 00B8	¹ 00B9	÷ 00F7	» 00BB	¼ 00BC	½ 00BD	¾ 00BE	
C0																
D0																‗ 2017
E0	א 05D0	ב 05D1	ג 05D2	ד 05D3	ה 05D4	ו 05D5	ז 05D6	ח 05D7	ט 05D8	י 05D9	ך 05DA	כ 05DB	ל 05DC	ם 05DD	מ 05DE	ן 05DF
F0	נ 05E0	ס 05E1	ע 05E2	ף 05E3	פ 05E4	ץ 05E5	צ 05E6	ק 05E7	ר 05E8	ש 05E9	ת 05EA					

HC0PG051

Figure 50. ISO 8859/8 (Latin/Hebrew)

ISO 8859/9 (Latin 5)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	NUL 0000	STX 0001	SOT 0002	ETX 0003	EOT 0004	ENQ 0005	ACK 0006	BEL 0007	BS 0008	HT 0009	LF 000A	VT 000B	FF 000C	CR 000D	SO 000E	SI 000F
10	DLE 0010	DC1 0011	DC2 0012	DC3 0013	DC4 0014	NAK 0015	SYN 0016	ETB 0017	CAN 0018	EM 0019	SUB 001A	ESC 001B	FS 001C	GS 001D	RS 001E	US 001F
20	SP 0020	! 0021	" 0022	# 0023	$ 0024	% 0025	& 0026	' 0027	(0028	) 0029	* 002A	+ 002B	, 002C	- 002D	. 002E	/ 002F
30	0 0030	1 0031	2 0032	3 0033	4 0034	5 0035	6 0036	7 0037	8 0038	9 0039	: 003A	; 003B	< 003C	= 003D	> 003E	? 003F
40	@ 0040	A 0041	B 0042	C 0043	D 0044	E 0045	F 0046	G 0047	H 0048	I 0049	J 004A	K 004B	L 004C	M 004D	N 004E	O 004F
50	P 0050	Q 0051	R 0052	S 0053	T 0054	U 0055	V 0056	W 0057	X 0058	Y 0059	Z 005A	[005B	\ 005C	] 005D	^ 005E	_ 005F
60	` 0060	a 0061	b 0062	c 0063	d 0064	e 0065	f 0066	g 0067	h 0068	i 0069	j 006A	k 006B	l 006C	m 006D	n 006E	o 006F
70	p 0070	q 0071	r 0072	s 0073	t 0074	u 0075	v 0076	w 0077	x 0078	y 0079	z 007A	{ 007B	| 007C	} 007D	~ 007E	DEL 007F
80																
90																
A0	NBSP 00A0	¡ 00A1	¢ 00A2	£ 00A3	¤ 00A4	¥ 00A5	¦ 00A6	§ 00A7	¨ 00A8	© 00A9	ª 00AA	« 00AB	¬ 00AC	- 00AD	® 00AE	¯ 00AF
B0	° 00B0	± 00B1	² 00B2	³ 00B3	´ 00B4	µ 00B5	¶ 00B6	· 00B7	¸ 00B8	¹ 00B9	º 00BA	» 00BB	¼ 00BC	½ 00BD	¾ 00BE	¿ 00BF
C0	À 00C0	Á 00C1	Ã 00C2	Ã 00C3	Ä 00C4	Å 00C5	Æ 00C6	Ç 00C7	È 00C8	É 00C9	Ê 00CA	Ë 00CB	Ì 00CC	Í 00CD	Î 00CE	Ï 00CF
D0	Ğ 011E	Ñ 00D1	Ò 00D2	Ó 00D3	Ô 00D4	Õ 00D5	Ö 00D6	× 00D7	Ø 00D8	Ù 00D9	Ú 00DA	Û 00DB	Ü 00DC	İ 0130	Ş 015E	ß 00DF
E0	à 00E0	á 00E1	â 00E2	ã 00E3	ä 00E4	å 00E5	æ 00E6	ç 00E7	è 00E8	é 00E9	ê 00EA	ë 00EB	ì 00EC	í 00ED	î 00EE	ï 00EF
F0	ğ 011F	ñ 00F1	ò 00F2	ó 00F3	ô 00F4	õ 00F5	ö 00F6	÷ 00F7	ø 00F8	ù 00F9	ú 00FA	û 00FB	ü 00FC	ı 0131	ş 015F	ÿ 00FF

HC0PG052

Figure 51. ISO 8859/9 (Latin 5)

ISO 8859/15 (Latin 9)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	NUL 0000	STX 0001	SOT 0002	ETX 0003	EOT 0004	ENQ 0005	ACK 0006	BEL 0007	BS 0008	HT 0009	LF 000A	VT 000B	FF 000C	CR 000D	SO 000E	SI 000F
10	DLE 0010	DC1 0011	DC2 0012	DC3 0013	DC4 0014	NAK 0015	SYN 0016	ETB 0017	CAN 0018	EM 0019	SUB 001A	ESC 001B	FS 001C	GS 001D	RS 001E	US 001F
20	SP 0020	! 0021	" 0022	# 0023	$ 0024	% 0025	& 0026	' 0027	(0028	) 0029	* 002A	+ 002B	, 002C	- 002D	. 002E	/ 002F
30	0 0030	1 0031	2 0032	3 0033	4 0034	5 0035	6 0036	7 0037	8 0038	9 0039	: 003A	; 003B	< 003C	= 003D	> 003E	? 003F
40	@ 0040	A 0041	B 0042	C 0043	D 0044	E 0045	F 0046	G 0047	H 0048	I 0049	J 004A	K 004B	L 004C	M 004D	N 004E	O 004F
50	P 0050	Q 0051	R 0052	S 0053	T 0054	U 0055	V 0056	W 0057	X 0058	Y 0059	Z 005A	[005B	\ 005C	] 005D	^ 005E	_ 005F
60	` 0060	a 0061	b 0062	c 0063	d 0064	e 0065	f 0066	g 0067	h 0068	i 0069	j 006A	k 006B	l 006C	m 006D	n 006E	o 006F
70	p 0070	q 0071	r 0072	s 0073	t 0074	u 0075	v 0076	w 0077	x 0078	y 0079	z 007A	{ 007B	| 007C	} 007D	~ 007E	DEL 007F
80																
90																
A0	NBSP 00A0	¡ 00A1	¢ 00A2	£ 00A3	€ 20AC	¥ 00A5	Š 0160	§ 00A7	š 0161	© 00A9	ª 00AA	« 00AB	¬ 00AC	- 00AD	® 00AE	¯ 00AF
B0	° 00B0	± 00B1	² 00B2	³ 00B3	Ž 017D	µ 00B5	¶ 00B6	· 00B7	ž 017E	¹ 00B9	º 00BA	» 00BB	Œ 0152	œ 0153	Ÿ 0178	¿ 00BF
C0	À 00C0	Á 00C1	Â 00C2	Ã 00C3	Ä 00C4	Å 00C5	Æ 00C6	Ç 00C7	È 00C8	É 00C9	Ê 00CA	Ë 00CB	Ì 00CC	Í 00CD	Î 00CE	Ï 00CF
D0	Ð 00D0	Ñ 00D1	Ò 00D2	Ó 00D3	Ô 00D4	Õ 00D5	Ö 00D6	× 00D7	Ø 00D8	Ù 00D9	Ú 00DA	Û 00DB	Ü 00DC	Ý 00DD	Þ 00DE	ß 00DF
E0	à 00E0	á 00E1	â 00E2	ã 00E3	ä 00E4	å 00E5	æ 00E6	ç 00E7	è 00E8	é 00E9	ê 00EA	ë 00EB	ì 00EC	í 00ED	î 00EE	ï 00EF
F0	ð 00F0	ñ 00F1	ò 00F2	ó 00F3	ô 00F4	õ 00F5	ö 00F6	÷ 00F7	ø 00F8	ù 00F9	ú 00FA	û 00FB	ü 00FC	ý 00FD	þ 00FE	ÿ 00FF

HC0PG053

Figure 52. ISO 8859/15 (Latin 9)

96 GREEK

	00	10	20	30	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0
00	NUL		SP	0	@	P	`									
01		DC1	!	1	A	Q	a	Π								
02		DC2	"	2	B	R	b	P								
03		DC3	#	3	C	S	Γ	Σ								
04		DC4	$	4	D	T	Δ									
05			%	5	E	U	e	T								
06			&	6	F	V	z	Y								
07	BEL		'	7	G	W	h	Φ								
08	BS	CAN	(	8	H	X	θ	X								
09	HT		)	9	I	Y	i	Ψ								
0A	LF		*	:	J	Z	k	Ω								
0B	VT	ESC	+	;	K	[	λ	{								
0C	FF		,	<	L	\	m	|							
0D	CR		-	=	M	]	n	}								
0E	SO		.	>	N	^	ξ	~								
0F	SI		/	?	O	_	o	DEL								SP

Figure 53. 96 GREEK

Hexadecimal to Decimal Table

Table 11. Hexadecimal to Decimal Table

	00	10	20	30	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0
00	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
01	1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
02	2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
03	3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
04	4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
05	5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
06	6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
07	7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
08	8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
09	9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
0A	10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
0B	11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
0C	12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
0D	13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
0E	14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
0F	15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

Appendix B. Interfaces

This section provides technical information for the parallel and serial interfaces.

The Parallel Interface

The parallel interface of this printer fully supports the Centronics protocol plus the specific features requested by the EPSON and IBM printer connection in monodirectional mode and the Compatibility and Nibbles modes in bidirectional mode, plus the negotiation phases and the device identifier (as IEEE P1284).

The parallel interface is available on a specific 36 contact connector type AMPHENOL 57-40360- 12-D56 or equivalent connector for 1284 Type B.

- Drive Capability

  Up to 15 feet (5 m) on AWG26 min. wire size of twisted conductors on TTL receiver. The max. reachable distance is conditioned by the host drive capability and by the noise level along the interface cable path.
- Printer Connector Type

  36 pins, 1284 Type B
- Cable Connector

  25 pin, 1284 A Type

Signals Description

According to the IEEE - P1284 Standard, the pins assume different meanings and are identified by different names depending on the actual handshaking mode as follows:

- Compatibility mode (Centronics)

  This lower level mode provides an asynchronous, byte-wide forward (host-to-peripheral) channel with data and status lines used according to their original definitions. The interfaces power up in the compatibility Mode Idle phase.
- Nibble Mode

  This mode provides an asynchronous, reverse (peripheral-to-host) channel, under control of the host. In this mode, peripheral device to host data bytes are sent as two sequential, four-bit nibbles using the four peripheral-to-host status lines. These two modes cannot be active simultaneously.
- Byte Mode

  This mode provides an asynchronous, byte-wide reverse (peripheral-to host) channel based on eight data lines of the interface for data and the control/status lines for handshaking. Byte mode is under host control and it cannot be simultaneously active with compatibility mode.

Operating Phases

The link protocol is mainly based on the following three phases:

- Negotiation Phase

  This phase is activated always by the host, only when in compatibility mode, and defines:
  - whether a bidirectional link protocol can be established.
  - the handshaking mode as well as the communications mode to be used.
  - the device identification, if supported.
- Communication Phase

  This phase is based on well defined handshaking rules which depend upon the selected link mode.
- Termination Phase

This phase is initiated by the host and returns the interface to the compatibility mode.

Parallel Interface Signals

Description of the signals in monodirectional link:

Signal Name	Pin N°	Source	Description
STROBE	1	HOST	Clock signal which controls data transmission with its falling edge.
ACK	10	PRINTER	Negative pulsed signal indicating that the printer has received data and is ready to accept the next set of data. Also sent when the printer is switched from off-line to on-line and at the end of the initialization time. The BUSY line is always active.
DATA BIT 1 DATA BIT 2 DATA BIT 3 DATA BIT 4 DATA BIT 5 DATA BIT 6 DATA BIT 7 DATA BIT 8	2 3 4 5 6 7 8 9	PRINTER / HOST	Data 8 is the most significant bit. These are the data lines used by host or printer to transfer control code or ASCII codes.
BUSY	11	PRINTER	When high, this signal indicates that the printer cannot accept data or control codes. This signal goes high during data processing, in test and program modes, during initialization, when the buffer is full, and when a paper jam, paper end or paper size error occurs, in case of a power-on reset, the reception of a STROBE signal, while the register was not yet read, or when the INIT line is still active.
PE	12	PRINTER	When high, this signal indicates that the automatic input bin is out of paper and paper cannot be loaded from an other bin.
SELECT	13	PRINTER	When high, this signal indicates that the printer is on-line. It is put to low state in case of initialization or test and program mode. In IBM Proprinter emulation in low condition this signal signals a off-line request from the operator panel, paper jam, paper end or paper size errors.
AUTOFEEDXT	14	HOST	Active low level signal. Indicates whether a LF is performed after a CR or not.
GND	16	–	Logical ground level (0V).
CHASSIS GND	17	–	Frame ground.
+5 VDC	18	PRINTER	Is the DC voltage supplied by a component that limits the driven capability up to 100 mA.
SIGNAL GND	19-30	–	Signal ground.
INIT	31	HOST	Active low level signal. Indicates, that the printer is initializing. The BUSY signal is forced high.
ERROR	32	PRINTER	When low, this signal indicates that the printer is offline, there is an offline request from the operator panel, or the printer is in an error state because of: paper jam, paper end or paper size error, engine error, output bin full or cover open condition.
+5V	35	PRINTER	Pulled up to signal.
SELECTIN	36	HOST	Active low level signal. Enables the printer.

The pins 1 to 14 of the printer are connected to the pins with the same number of the parallel port of the host.

The pins 19 to 30 of the printer are connected to the pins 18 to 25 of the parallel port of the host.

The pins 31, 32 and 36 of the printer are connected respectively to the pins 16, 15 and 17 of the parallel port of the host.

1284 Mode signal names are shown with their Compatibility mode (Centronics) names in parenthesis ( ) for the bidirectional link.

Signal Name	Pin N° for Signal Wire	Pin N° for Return Wire	Source
HostClk (nStrobe)	1	19	HOST
AD1 (Data 1)	2	20	HOST in Compatibility mode and negotiation phase.
AD2 (Data 2)	3	21	
AD3 (Data 3)	4	22	NOT USED in Nibble mode.
AD4 (Data 4)	5	23	
AD5 (Data 5)	6	24	BIDIRECTIONAL in Byte mode.
AD6 (Data 6)	7	25	
AD7 (Data 7)	8	26	
AD8 (Data 8)	9	27	
PrtClk (nAck)	10	28	PRINTER
PrtBusy (Busy)	11	29	PRINTER
AckDataReq (PError)	13	28	PRINTER
Xflag (Select)	14	28	PRINTER
HostBusy (nAutofd)	15	30	HOST
Peripheral Logic High (+5 V)	18		PRINTER
n.a. (nInit)	31	30	HOST
nDataAvail (NFault)	32	29	PRINTER
1284 Active (NSelectIn)	36	30	
Common Logic Ground	16 and Return Wires		
Chassis Ground	17		

Parallel Interface Signals Behaviour

HostClk /nWrite (nStrobe)	
Compatibility Mode:	Set Active low to transfer data into printer input latch. Data is valid while nStrobe is low.
Negotiation Phase:	Set active low to transfer extendibility request value into printer input latch. Data is valid on the falling edge of HostClk.
Reverse Data Transfer Phase:	Set high during Nibble Mode transfer to avoid latching data into printer. Pulsed low during Byte Mode transfers to acknowledge transfer of data from the printer. The printer shall ensure that this pulse does not transfer a new data into the printer input latch.

AD1 ... AD8 (Data 1 ... Data 8)	
Compatibility Mode:	Forward channel data.

AD1 ... AD8 (Data 1 ... Data 8)		
Negotiation Phase:	Extendibility request value.	
Reverse Data Transfer Phase:	Nibble Mode:	NOT USED.
	Byte Mode:	Reverse channel data.

PrtClk (nAck)	
Compatibility Mode:	Pulsed low by the printer to acknowledge the transfer of a data from the host.
Negotiation Phase:	Set low to acknowledge 1284 support, then set high to indicate that the Xflag (Select) and data available flags may be read.
Reverse Data Transfer Phase:	Used in both Nibble and Byte Modes to qualify data being sent to the host.

PrtBusy (Busy)		
Compatibility Mode:	Driven high to indicate that the printer is not ready to receive data.	
Negotiation Phase:	Reflects the present state of the printer's forward channel.	
Reverse Data Transfer Phase:	Nibble Mode:	Data bits 3 then 7, then forward channel busy status
	Byte Mode:	Forward channel busy status.
Reverse Idle phase:	Forward channel busy status.	

AckDataReq (PError)		
Compatibility Mode:	Driven high to indicate that the printer has encountered an error in the paper path. The printer shall set nFault low whenever it sets PError high.	
Negotiation Phase:	Set high to indicate 1284 support, then follows nDataAvail (nFault).	
Reverse Data Transfer Phase:	Nibble Mode:	Data bits then 6.
	Byte Mode:	same as nDataAvail (nFault)
Reverse Idle phase:	Set high until host requests data transfer, then follows nDataAvail (nFault).	

Xflag (Select)		
Compatibility Mode:	Set high to indicate that the printer in on-line.	
Negotiation Phase:	The Xflag refers to extendibility flag. Used by the printer to reply to the requested extendibility byte sent by the host during the negotiation phase. The signal level is low for Nibble Mode, high for Byte Mode.	
Reverse Data Transfer Phase:	Nibble Mode:	Data bits 1 then 5.
	Byte Mode:	Same as negotiation phase.
Reverse Idle phase:	Same as negotiation phase.	

Xflag (Select)	
Compatibility Mode:	Set low by host to put the printer into auto-line feed mode.
Negotiation Phase:	Set low in conjunction with 1284 Active (NSelectIn) being set high to request a 1284 mode.
	Then set high after printer sets PtrClk (nAck) low.

Xflag (Select)		
Reverse Data Transfer Phase:	Nibble Mode:	Set low to indicate that host can receive printer-to-host data then set high to acknowledge receipts of that nibble.
	Byte Mode:	Same as Nibble Mode to request and acknowledge bytes. Following a reverse channel transfer the interface transitions to idle phase when HostBusy (nAutoFd) is set low and printer's no data available.
Reverse Idle phase:	Set high in response to PtrClk (nAck) low pulse to re-enter reverse data transfer phase. Is set high with 1284 Active (nSelectIn) being set low, the 1284 idle phase is being aborted and the interface returns to Compatibility Mode.	
Peripheral Logic High (+ 5V)		
Set high to indicate that all other signals sourced by the printer are in valid state. Set low to indicate the printer is off.		

n.a. (nInit)	
Compatibility Mode:	Pulsed low in conjunction with 1284 Active low to reset the interface and force to return to Compatibility Mode idle phase.
Negotiation Phase:	Set HIGH.
Reverse Data Transfer Phase:	Set HIGH.

nDataAvail (NFault)		
Compatibility Mode:	Set low to indicate that an internal printer error has occurred.	
Negotiation Phase:	Set high to acknowledge 1284 compatibility. In Nibble or Byte Mode it is then set low to indicate printer-to-host data is available following host setting HostBusy (nAutoFd) high.	
Reverse Data Transfer Phase:	Nibble Mode:	Set low to indicate that printer is ready to send to host. Then used to send data bits 0 then 4.
	Byte Mode:	Used to indicate that data is available.
Reverse Idle phase:	Used to indicate that data is available.	

nDataAvail (NFault)		
Compatibility Mode:	Set low to indicate that an internal printer error has occurred.	
Negotiation Phase:	Set high to acknowledge 1284 compatibility. In Nibble or Byte Mode it is then set low to indicate printer-to-host data is available following host setting HostBusy (nAutoFd) high.	
Reverse Data Transfer Phase:	Nibble Mode:	Set low to indicate that printer is ready to send to host. Then used to send data bits 0 then 4.
	Byte Mode:	Used to indicate that data is available.
Reverse Idle phase:	Used to indicate that data is available.	

1284 Active (NSelectIn)	
Compatibility Mode:	Set low by host to select printer.
Negotiation Phase:	Set high in conjunction with Host Busy being set low to request a 1284 mode.
Reverse Data Transfer Phase:	Set high to indicate that bus direction is printer to host. Set low to terminate 1284 mode and set bus direction host to printer.
Reverse Idle Phase:	Same as Reverse Data Transfer phase.

Interface Timing

Timing and Handshaking depend upon the connection mode.

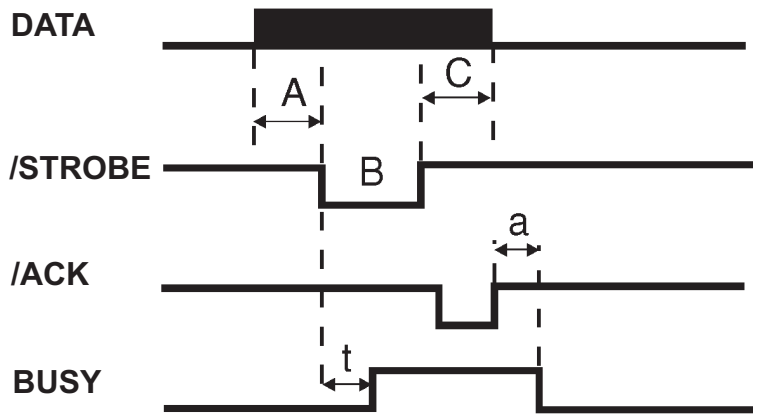


Figure 54. Mode Centronics

Our Centronics mode supports the BUSY-WHILE-STROBE busy signal timing and ACK-INBUSY as BUSY-ACK relationship.

Legend	Time interval	Min.	Max.	all times in µs
A	Data Setup Time	1.0		
B	Strobe pulse width	1.0	500	
C	Data hold time	1.0		
t	Busy while Strobe	0.25	1.0	
a	Ack in Busy	0	2.5	

Mode IEEE 1284

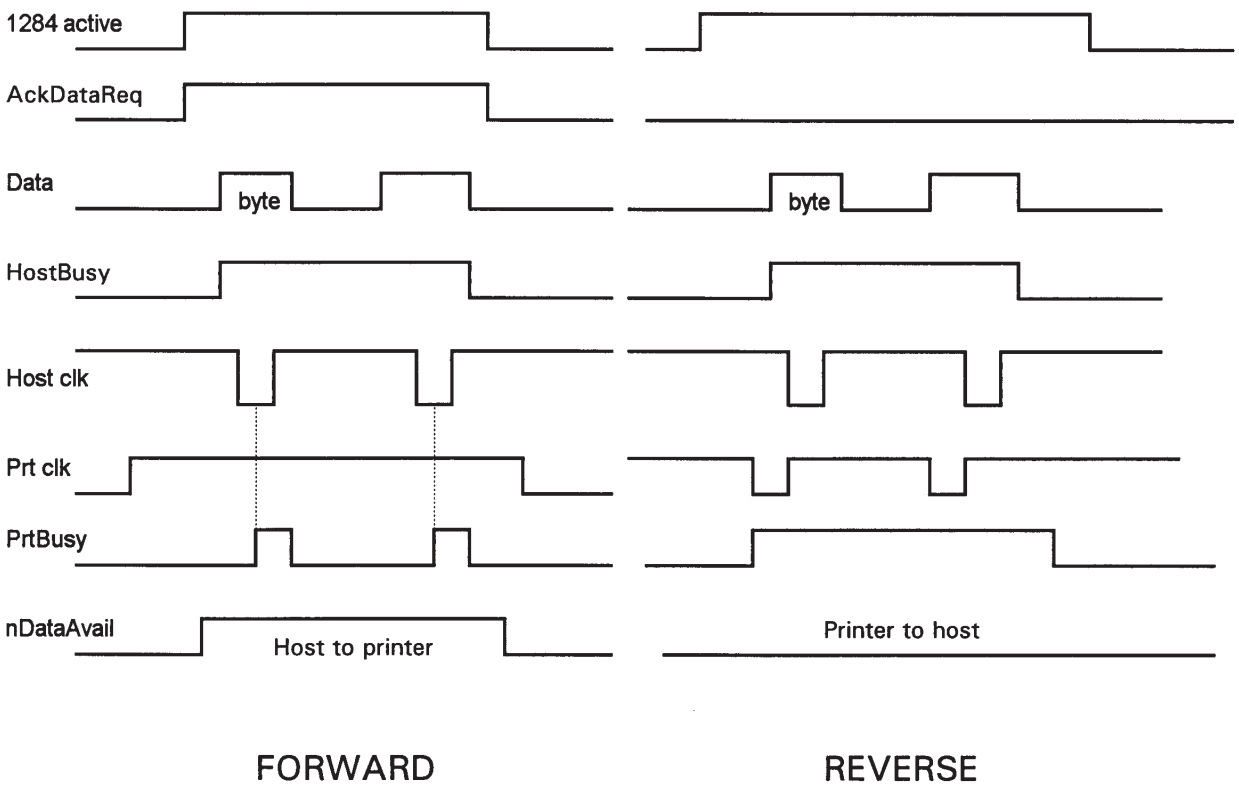


Figure 55. Mode IEEE 1284

The Serial Interface

This printer provides the RS-232/C serial interfaces. The interface mode is selected via menu.

- Transmission Type

  Data is sent and received in start/stop (asynchronous) transmission.
- Character Format

  Each character is transmitted in the following format:

  1 START BIT + 8 DATA BITS + 1 PARITY BIT + 1 STOP BIT

  The least significant bit of the data bits is sent first after the start bit. The number of data bits is selected via menu. The parity bit, when present, follows the data bits. The start bit is a logical “0” and the stop bit is a logical “1”. The start and stop bits are used as character framing bits.
- Printer Connector

  Male DB9 or equivalent connector.
- Drive Capability

  Max. 50 feet (15 m) for all supported data rates. The RS-422/A interface is effective up to 1200 m.

Serial Interface Signals

The following table lists the RS-232/C serial interface signals:

Signal Name	Pin Number	Local Connect. Source	Remote Connect. Source	Description
SIGNAL GROUND	5	–	–	Always connected to the 0 Volts of the Power Supply
TXD	3	Printer	Printer	Transmitted Data Signal (an output from printer). A MARK condition is held during IDLE communication state. An indeterminate state is present when printer is powered off.
RXD	2	Host	Data Set	Received data signal (an input to printer).
RTS	7	Printer	Printer	Request to Send Signal (an output from printer). Active HIGH level signal. It is HIGH until the printer is powered off, then an indeterminate state is present .
CTS	8		Data Set	Active HIGH level signal indicates that the host or data set is ready to receive data from the printer.
DSR	6		Data Set	Active HIGH level signal. Indicates that the host or data set is ready to be connected to the printer and is ready for data transfer.
DCD	1		Data Set	Active HIGH level signal. Indicates that the host is transmitting or the data set is receiving the Data Carrier signal.
2nd RTS	9	Printer		Functionally equivalent to the DTR signal.
DTR	4	Printer	Printer	Data Terminal Ready. Normally HIGH (ON). Indicates that the printer is ready to initiate a connection.

LAN Interface Port

LAN Interface Port

1. Ethernet 10/100BaseT Connector
2. Green 10/100Mbit/sec. Transmission Speed LED
3. Yellow Traffic LED

LED Indicators

The LED indicator modes are described in the following table:

LED	Status	Description
Yellow LED	Unlit	Transmission speed at 10Mbit/sec.
	Lit	Transmission speed at 100Mbit/sec.
Green LED	Blinks	Transmitting or receiving packets from the network.

USB Interface Port

USB 2.0 full speed 12 Mbit/sec. interface.

Appendix C. Network Interface Technical Reference

General Help Information

This is the on-line configuration and status reference for the 4247 network interface. Through these HTML pages you can configure settings and view the status of the printer.

4247 Printers Remote Printer Management Utility

The Remote Printer Management Utility (RPMU) is a software tool for network administrator's that allows the configuration and control of 4247 printers remotely over a LAN. With this tool the installed printers can be controlled, configured and organized easily. The main features are:

Device Discovery - Searches for the devices within a range of IP addresses.

Printer Organization - Printers connected to the network can be organized into logical groups in a hierarchically structured tree.

Printer Status Report - Checks the printer's status and reports alarms.

Printer Configuration -Printers may be configured as needed from the administrator's workstation. Change the configuration of single printers, or simultaneously change the configuration of multiple printers in your enterprise, anywhere, and anytime.

Firmware Updating - Provides a firmware download function to upgrade the printer's firmware.

Remote Operator Panel Management - Provides a virtual operator panel for the remotely connected printer at the administrator's workstation that allows performing all functions normally achieved pressing the operator panel keys. The RPMU also provides the basic status management for third-party printers compliant to the standard MIB objects. Visit our website to download this free software utility program.

4247 Network Interface Internal Webpage

Configuration Password

The 4247's configuration settings can be protected by a password to keep unauthorized users from making changes. When you try to submit any 4247 configuration change, you will be asked for your user name and password. At the prompt, enter the default user **`name = root and default password = root`**, unless you have setup another user name and password with root privileges.

Storing and Saving Settings

When settings are configured on the 4247 and the SUBMIT button on the related page has been pressed, you will be reminded to Reboot the printer to ensure the latest settings are in use. To reset the 4247, go to the Home page, enter the Power On Reset page, and Click on the REBOOT PRINTER button.

Network Configuration

The 4247 IP address, subnet mask, and gateway address can be changed though the printer operator panel or though these pages. Fixed and DHCP assignments of IP addresses are supported. On most networks, you will want to assign a permanent IP address and disable DHCP. The gateway address tells the printer which router or gateway to use to access other subnets or hosts. Simply add your router's IP address as the default router. All packets destined for other subnets will be forwarded to the default router for delivery to the destination host.

The following network settings can be configured through these pages.

IP Address Assignment

Fixed: Assigns the static or fixed IP address.
DHCP: Assigns the dynamic IP address (DHCP protocol).
Default value is Fixed.

IP Address

These values set the IP Address. The address is represented by a decimal notation where the decimal values are divided by points in four fields.
Each field ranges between 0 and 255.
Default is *127.000.000.000*.

Subnet Mask

These values set the Subnet Mask number. This number is represented by a decimal notation where the decimal values are divided by points in four fields. Each field ranges between 0 and 255.
Default is *255.255.254.000*.

Default Gateway

These values set the Default Gateway address. This address is represented by a decimal notation where the decimal values are divided by points in four fields. Each field ranges between 0 and 255.
Default is *000.000.000.000*.

Host Name

The host is identified by a name in the NetBIOS protocol over TCP/IP. This function allows creating the name of the host using a 14-character string.
Default is *4247_xxxxxx where xxxxxx are the last 6-digits of the MAC address...*

Workgroup Name

The workgroup is identified by a name in the NetBIOS protocol over TCP/IP in Windows®. This function allows creating the name of the workgroup using a 14-character string.
Default is *Workgroup*.

SMTP Service

Disabled: Disables the SMTP (Simple Mail Transfer Protocol) service, that is disables the reception/transfer/error service of the e-mail.
Enabled: Enables the SMTP service, that is enables the reception/transfer/error service of the e-mail.
Default is *Disabled*.

Mail Server Address

These values set the mail server address. This number is represented by a decimal notation where the decimal values are divided by points in four fields. Each field ranges between 0 and 255.
Default is *000.000.000.000*.

Note: Item selection on the printer menu allowed only if the “SMTP Service” function choice is Enabled.

E-mail Address (Receiver)

This function allows writing the e-mail address where you can notify the failures using a 48-character string. Default is an empty string.
Note: Item selection on the printer menu allowed only if the “SMTP Service” function choice is Enabled.

E-mail Address (Sender)

This function allows to write the sender e-mail address using a 48-character string.
Default is an empty string.

Note: Item selection on the printer menu allowed only if the “SMTP Service” function choice is Enabled.

Location

You can enter the physical location of the printer into this field.

Contact

You can enter a network support contact's name and phone number into this field.

4247 Network Interface Summary

INSTALLATION INTEGRATION	
Network speed / connection	10/100 BASET
Auto-detection 10/100 network speed	Yes
Manual network speed selection	No
Parallel interface free	Yes
Network configuration through printer operator panel	Yes
Web page network setting configuration	Yes
Web page login password protection	Yes
Web page default user-id and default password	Root, Root
Windows Port Monitor and Drivers	Yes
NIC configuration printout	Yes
DHCP	Yes
WINS	Yes
DDNS	Yes
SYSTEM / OS	
IBM System i® OS 400	Yes
IBM pSeries® AIX®	Yes
Sun Solaris	Yes
Unix	Yes
Linux®	Yes
Windows 95, 98, 2000, NT, XP, 2003 Server, Vista, Windows 7 32 and 64 bit, and so forth	Yes
NETBIOS over TCP	Yes
NETBEUI	No
Novell Netware	No
OS2	No
MacIntosh / Apple EtherTalk	No
PRINTING METHODS	
Raw Port 9100	Yes
LPD/LPR Port 515	Yes
LPR print queue name	Any name (PR1, d1PRN, etc.) can be used.
IPDS™ Port 5100	Yes (with IPDS option on some models)
Interleaved multi-protocol communications	Yes
Hot Interface switching	Yes between Parallel and LAN interfaces
Hot Port switching	Yes between Raw 9100, LPR/LPD 515, and IPDS 5100 (with IPDS option installed on some models)
Multiple internal print server queues	No

String substitutions	No
String before/after job	No
DATASTREAMS	
4247 ASCII native	Yes
ASCII text and single byte escapes	Yes
IBM Proprinter XL24 / XL24 AGM emulation	Yes (on some models)
IBM Personal Printer 2391 emulation	Yes (on some models)
IBM Proprinter III XL emulation	Yes (on some models)
IBM Personal Printer 2381 emulation	Yes (on some models)
Epson LQ series emulation	Yes (on some models)
Epson - FX emulation	Yes (on some models)
Epson LQ1600K with GB18030 character set emulation	Yes (with DBCS option on some models)
IPDS	Yes (with IPDS option on some models)
PRINTER SERVER FACILITIES SUPPORT	
PSF AIX	Yes
PSF OS400	Yes
PSF MVS™	Yes
PSF VSE	Yes
PSF VM	Yes
NETWORK MANAGEMENT	
4247 Remote Printer Management Utility	Yes
IBM NPM	Yes (generic printer)
HP JetAdmin	Yes (generic printer)
E-mail SMTP	Yes
Internal Web page	Yes
PRINTER STATUS AND ERROR REPORTING	
Ready	Yes
Not ready	Yes
Paper out	Yes
Paper jam	Yes
Cover open	Yes
Machine check (carriage fault, ribbon blocked...)	Yes
NETWORK CONFIGURATION PARAMETERS (see above)	
LINK LAYER	
Ethernet II	Yes
802.2	Yes
802.3	Yes
2/SNAP	Yes
Link disconnect (no data timeout)	15 second fixed setting
PROTOCOLS	
IP	Yes
TCP	Yes

UDP	Yes
ARP	Yes
RARP	Yes
SMP	Yes
Telnet	Yes
DHCP	Yes
DDNS	Yes
WINS	Yes
BOOTP	Yes
FTP	Yes
TFTP	Yes
ICMP	Yes
LPR/LPD	Yes
DHCP	Yes
SNMP	Yes
SMTP	Yes
Direct Socket Printing	Yes
HTTP	Yes
PING	Yes
SNMP	Yes
MIB II (RFC 1514)	Yes (see note)
Host Resource MIB (RFC 1514)	Yes
Printer MIB (RFC1759)	Yes
4247 Private MIB	Yes
Reverse Telnet	No
PROS	No
IPP	No
SLPv2	No
HARDWARE	
RISC processor	Yes
Flash memory	4MB
RAM	16MB
Attachment connector type	RJ-45
Network traffic led	Yes (green)
Network speed led	Yes (yellow)
FIRMWARE UPGRADE	
Firmware upgrade over network	Yes
Firmware upgrade through parallel interface	Yes

Note: All relevant parts of MIB-II (RFC1231) required to support HP JetAdmin are implemented.

- - The following IP table group OIDs are not implemented: ipForwarding, ipDefaultTTL , ipInReceives ,ipInHdrErrors,ipInAddrErrors, ipForwDatagrams, ipInUnknownProtos, ipInDiscards, ipInDelivers, ipOutRequests, ipOutDiscards, ipOutNoRoutes, ipReasmTimeout ,ipReasmReqds, ipReasmOKs,ipReasmFails,ipFragOKs, ipFragFails, ipFragCreates
- The ipRouteTable OIDs are not implemented.
- The ipNetToMediaTable OIDs are not implemented.
- The icmp group OIDs are not implemented.
- The tcp group OIDs are not implemented.
- The udp group OIDs are not implemented.
- The snmp group OIDs are not implemented.

IBM systems - LAN printing technical support documents on the world-wide-web

The following AS/400® iSeries® documents and many others can be found by selecting the "Technical databases" link at the iSeries Technical Support area of the IBM website.

32815, Configuring a *LAN 3812 SNMP Device Description

This document contains information on configuring *LAN 3812 SNMP device descriptions for LAN attached ASCII printers. The term SNMP refers to Simple Network Management Protocol. SNMP allows for two-way communication with the printer when attached to the LAN using a print server that also supports SNMP. Support for the SNMP print driver is available in the base code for R450 IBM OS/400® and above, and is being added to R430 and R440 OS/400 through PTFs. This is an alternative to using Remote Output Queues (RMTOUTQs).

19934440, Recommended SNMP Port Number Values for *LAN 3812 SNMP Device Descriptions

This document contains a list of recommended SNMP Port Number Values for *LAN 3812 SNMP printer device descriptions, depending on the type of network interface or print server being used with your printer. The Port number (PORT) parameter specifies which TCP/IP port to use when printing operating system spooled files from an IBM System i family of servers system through a *LAN 3812 SNMP device description to a printer on a Local Area Network (LAN) or Wide Area Network (WAN). Therefore, the specified TCP/IP port must be open on any firewalls, routers or SOCK servers used between the iSeries family system and the printer. If the specified TCP/IP port is closed, the printer writer for the *LAN 3812 SNMP device description will be unable to open a connection with the printer and will therefore not be able to print to that printer.

8983237, Configuring a Remote Output Queue (RMTOUTQ)

This document contains information on configuring and using a Remote Output Queue (RMTOUTQ) for sending IBM OS/400 or IBM i5/OS® spooled files to an output queue on another IBM System i family of servers, or to print OS/400 or i5/OS spooled files to printers that are attached to the LAN/WAN using a print server, a PC, or a Unix server. Requirements include a TCP/IP interface configured in the OS/400 or i5/OS, a TCP/IP address on the printer side, and a Line Print Daemon (LPD) TCP/IP process running on the print server, PC or Unix server.

18762910, Configuring a *LAN 3812 Device Description that Uses the LPR Print Driver (TSPLPRD) Exit Program

The LPR Print Driver (TSPLPRD) exit program is an unsupported utility that provides the function of sending spooled files from an output queue to an ASCII printer which is attached to an LPD server. This is a similar function to what is provided using remote output queues in IBM OS/400 or IBM i5/OS, but differs because this driver exit program is specified on a printer device description. Thus, it can make use of

information specified about the printer in the device description which is not available on a remote output queue. Also, because it uses LPR within a printer writer, it supports page ranges yet can be used with any printer that currently uses a remote output queue – including dot matrix and line printers.

This exit program also serves the purpose of providing an example of a Print Driver Exit, as it is written to the Print Driver Exit interface as documented in the *AS/400 System API Reference* manual. This exit program was introduced in the R440 version of QUSRTOOL, but will work with R410 and later versions of OS/400. This tool is supplied as is without support. Therefore, any assistance with configuring or using a printer device description that uses an LPR print driver exit program must be done through Consult Line/400.

Appendix D. LAN Interface MIB Support

Table 12. SYSTEM GROUP - RFC 1213

OBJECT ID	MIB	TYPE
sysDescr.0	1.2.6.1.2.1.1.1.0	(octet string)
sysObjectID.0	1.2.6.1.2.1.1.2.0	(object identifier)
sysUpTime.0	1.2.6.1.2.1.1.3.0	(timeticks)
sysContact.0	1.2.6.1.2.1.1.4.0	(octet string)
sysName.0	1.2.6.1.2.1.1.5.0	(octet string)
sysLocation.0	1.2.6.1.2.1.1.6.0	(octet string)
sysServices.0	1.2.6.1.2.1.1.7.0	(integer)

Table 13. INTERFACE GROUP - RFC 1213

OBJECT ID	MIB	TYPE
ifNumber.0	1.3.6.1.2.1.2.1.0	(integer)
ifIndex.1	1.3.6.1.2.1.2.2.1.1.1	(integer)
ifDescr.1	1.3.6.1.2.1.2.1.1.2.1	(octet string)
ifType.1	1.3.6.1.2.1.2.2.1.3.1	(integer)
ifMtu.1	1.3.6.1.2.1.2.2.1.4.1	(integer)
ifSpeed.1	1.3.6.1.2.1.2.2.1.5.1	(gauge)
ifPhysAddress.1	1.3.6.1.2.1.2.2.1.6.1	(octet string)
ifAdminStatus.1	1.3.6.1.2.1.2.2.1.7.1	(integer)
ifOperStatus.1	1.3.6.1.2.1.2.2.1.8.1	(integer)
ifLastChange.1	1.3.6.1.2.1.2.2.1.9.1	(timeticks)
ifInOctets.1	1.3.6.1.2.1.2.2.1.10.1	(counter)
ifInUcastPkts.1	1.3.6.1.2.1.2.2.1.11.1	(counter)
ifInNUcastPkts.1	1.3.6.1.2.1.2.2.1.12.1	(counter)
ifInDicards.1	1.3.6.1.2.1.2.2.1.13.1	(counter)
ifInErrors.1	1.3.6.1.2.1.2.2.1.14.1	(counter)
ifInUnknownProtos.1	1.3.6.1.2.1.2.2.1.15.1	(counter)
ifOutOctets.1	1.3.6.1.2.1.2.2.1.16.1	(counter)
ifOutUcastPkts.1	1.3.6.1.2.1.2.2.1.17.1	(counter)
ifOutNUcastPkts.1	1.3.6.1.2.1.2.2.1.18.1	(counter)
ifOutDiscatds.1	1.3.6.1.2.1.2.2.1.19.1	(counter)
ifOutErrors.1	1.3.6.1.2.1.2.2.1.20.1	(counter)
ifOutQLen.1	1.3.6.1.2.1.2.2.1.21.1	(gauge)
ifSpecific.1	1.3.6.1.2.1.2.2.1.22.1	(object identifier)

Table 14. ADDRESS GROUP - RFC 1213

OBJECT ID	MIB	TYPE
IpAdEntAddr.1	1.3.6.1.2.1.4.20.1.1.1	(ipaddress)
IpAdEntIfIndex.1	1.3.6.1.2.1.4.20.1.1.2	(integer)

Table 14. ADDRESS GROUP - RFC 1213 (continued)

OBJECT ID	MIB	TYPE
IpAdEntNetMask.1	1.3.6.1.2.1.4.20.1.1.3	(ipaddress)
IpAdEntBcastAddr.1	1.3.6.1.2.1.4.20.1.1.4	(integer)
IpAdEntReasmMaxSize.1	1.3.6.1.2.1.4.20.1.1.5	(integer)

Table 15. HOST RESOURCES - RFC 1213

OBJECT ID	MIB	TYPE
hrSystemUptime.0	1.3.6.1.3.1.25.1.1.0	(timeticks)
hrStorageIndex.1	1.3.6.1.3.1.25.2.3.1.1.1	(integer)
hrStorageIndex.2	1.3.6.1.3.1.25.2.3.1.1.2	(integer)
hrStorageIndex.3	1.3.6.1.3.1.25.2.3.1.1.3	(integer)
hrStorageIndex.4	1.3.6.1.3.1.25.2.3.1.1.4	(integer)
hrStorageType.1	1.3.6.1.3.1.25.2.3.1.2.1	(object identifier)
hrStorageType.2	1.3.6.1.3.1.25.2.3.1.2.2	(object identifier)
hrStorageType.3	1.3.6.1.3.1.25.2.3.1.2.3	(object identifier)
hrStorageType.4	1.3.6.1.3.1.25.2.3.1.2.4	(object identifier)
hrStorageDescr.1	1.3.6.1.3.1.25.2.3.1.3.1	(octet string)
hrStorageDescr.2	1.3.6.1.3.1.25.2.3.1.3.2	(octet string)
hrStorageDescr.3	1.3.6.1.3.1.25.2.3.1.3.3	(octet string)
hrStorageDescr.4	1.3.6.1.3.1.25.2.3.1.3.4	(octet string)
hrStorageAllocationUnits.1	1.3.6.1.3.1.25.2.3.1.4.1	(integer)
hrStorageAllocationUnits.2	1.3.6.1.3.1.25.2.3.1.4.2	(integer)
hrStorageAllocationUnits.3	1.3.6.1.3.1.25.2.3.1.4.3	(integer)
hrStorageAllocationUnits.4	1.3.6.1.3.1.25.2.3.1.4.4	(integer)
hrStorageSize.1	1.3.6.1.3.1.25.2.3.1.5.1	(integer)
hrStorageSize.2	1.3.6.1.3.1.25.2.3.1.5.2	(integer)
hrStorageSize.3	1.3.6.1.3.1.25.2.3.1.5.3	(integer)
hrStorageSize.4	1.3.6.1.3.1.25.2.3.1.5.4	(integer)
hrStorageUsed.1	1.3.6.1.3.1.25.2.3.1.6.1	(integer)
hrStorageUsed.2	1.3.6.1.3.1.25.2.3.1.6.2	(integer)
hrStorageUsed.3	1.3.6.1.3.1.25.2.3.1.6.3	(integer)
hrStorageUsed.4	1.3.6.1.3.1.25.2.3.1.6.4	(integer)
hrStorageAllocationFailures.1	1.3.6.1.3.1.25.2.3.1.7.1	(counter)
hrStorageAllocationFailures.2	1.3.6.1.3.1.25.2.3.1.7.2	(counter)
hrStorageAllocationFailures.3	1.3.6.1.3.1.25.2.3.1.7.3	(counter)
hrStorageAllocationFailures.4	1.3.6.1.3.1.25.2.3.1.7.4	(counter)
hrDeviceIndex.1	1.3.6.1.3.1.25.3.2.1.1.1	(integer)
hrDeviceIndex.2	1.3.6.1.3.1.25.3.2.1.1.2	(integer)
hrDeviceType.1	1.3.6.1.3.1.25.3.2.1.2.1	(object identifier)
hrDeviceType.2	1.3.6.1.3.1.25.3.2.1.2.2	(object identifier)
hrDeviceDescr.1	1.3.6.1.3.1.25.3.2.1.3.1	(octet string)

Table 15. HOST RESOURCES - RFC 1213 (continued)

OBJECT ID	MIB	TYPE
hrDeviceDescr.2	1.3.6.1.3.1.25.3.2.1.3.2	(octet string)
hrDeviceID.1	1.3.6.1.3.1.25.3.2.1.4.1	(object identifier)
hrDeviceID.2	1.3.6.1.3.1.25.3.2.1.4.2	(object identifier)
hrDeviceStatus.1	1.3.6.1.3.1.25.3.2.1.5.1	(integer)
hrDeviceStatus.2	1.3.6.1.3.1.25.3.2.1.5.2	(integer)
hrDeviceErrors.1	1.3.6.1.3.1.25.3.2.1.6.1	(counter)
hrDeviceErrors.2	1.3.6.1.3.1.25.3.2.1.6.2	(counter)
hrPrinterStatus.1	1.3.6.1.3.1.25.3.5.1.1.1	(integer)
hrPrinterDetectedErrorState.1	1.3.6.1.3.1.25.3.5.1.2.1	(octet string)

Table 16. PRINTER - RFC 1759

OBJECT ID	MIB	TYPE
prtGeneralConfigChanges.1	1.3.6.1.2.1.43.5.1.1.1.1	(counter)
prtGeneralCurrentLocalization.1	1.3.6.1.2.1.43.5.1.1.2.1	(integer)
prtGeneralReset.1	1.3.6.1.2.1.43.5.1.1.3.1	(integer)
prtGeneralCurrentOperator.1	1.3.6.1.2.1.43.5.1.1.4.1	(integer)
prtGeneralServicePerson.1	1.3.6.1.2.1.43.5.1.1.5.1	(integer)
prtInputDefaultIndex.1	1.3.6.1.2.1.43.5.1.1.6.1	(integer)
prtOutputDefaultIndex	1.3.6.1.2.1.43.5.1.1.7.1	(integer)
prtMarkerDefaultIndex.1	1.3.6.1.2.1.43.5.1.1.8.1	(integer)
prtMediaPathDefaultIndex.1	1.3.6.1.2.1.43.5.1.1.9.1	(integer)
prtConsoleLocalization.1	1.3.6.1.2.1.43.5.1.1.10.1	(integer)
prtConsoleNumberOfDisplayLines.1	1.3.6.1.2.1.43.5.1.1.11.1	(integer)
prtConsoleNumberOfDisplayChars.1	1.3.6.1.2.1.43.5.1.1.12.1	(integer)
prtCcnsoleDisable.1	1.3.6.1.2.1.43.5.1.1.13.1	(integer)
prtCoverDescription.1.1	1.3.6.1.2.1.43.6.1.1.2.1.1	(octet string)
prtCoverStatus.1.1	1.3.6.1.2.1.43.6.1.1.3.1.1	(integer)
prtLocalizationLanguage.1.1	1.3.6.1.2.1.43.7.1.1.2.1.1	(octet string)
prtLocalizationLanguage.1.2	1.3.6.1.2.1.43.7.1.1.2.1.2	(octet string)
prtLocalizationLanguage.1.3	1.3.6.1.2.1.43.7.1.1.2.1.3	(octet string)
prtLocalizationLanguage.1.4	1.3.6.1.2.1.43.7.1.1.2.1.4	(octet string)
prtLocalizationLanguage.1.5	1.3.6.1.2.1.43.7.1.1.2.1.5	(octet string)
prtLocalizationLanguage.1.6	1.3.6.1.2.1.43.7.1.1.2.1.6	(octet string)
prtLocalizationLanguage.1.7	1.3.6.1.2.1.43.7.1.1.2.1.7.	(octet string)
prtLocalizationLanguage.1.8	1.3.6.1.2.1.43.7.1.1.2.1.8	(octet string)
prtLocalizationLanguage.1.9	1.3.6.1.2.1.43.7.1.1.2.1.9	(octet string)
prtLocalizationLanguage.1.10	1.3.6.1.2.1.43.7.1.1.2.1.10	(octet string)
prtLocalizationLanguage.1.11	1.3.6.1.2.1.43.7.1.1.2.1.11	(octet string)
prtLocalizationCountry.1.1	1.3.6.1.2.1.43.7.1.1.3.1.1	(octet string)
prtLocalizationCountry.1.2	1.3.6.1.2.1.43.7.1.1.3.1.2	(octet string)

Table 16. PRINTER - RFC 1759 (continued)

OBJECT ID	MIB	TYPE
prtLocalizationCountry.1.3	1.3.6.1.2.1.43.7.1.1.3.1.3	(octet string)
prtLocalizationCountry.1.4	1.3.6.1.2.1.43.7.1.1.3.1.4	(octet string)
prtLocalizationCountry.1.5	1.3.6.1.2.1.43.7.1.1.3.1.5	(octet string)
prtLocalizationCountry.1.6	1.3.6.1.2.1.43.7.1.1.3.1.6	(octet string)
prtLocalizationCountry.1.7	1.3.6.1.2.1.43.7.1.1.3.1.7	(octet string)
prtLocalizationCountry.1.8	1.3.6.1.2.1.43.7.1.1.3.1.8	(octet string)
prtLocalizationCountry.1.9	1.3.6.1.2.1.43.7.1.1.3.1.9	(octet string)
prtLocalizationCountry.1.10	1.3.6.1.2.1.43.7.1.1.3.1.10	(octet string)
prtLocalizationCountry.1.11	1.3.6.1.2.1.43.7.1.1.3.1.11	(octet string)
prtLocalizationCharacterSet.1.1	1.3.6.1.2.1.43.7.1.1.4.1.1	(integer)
prtLocalizationCharacterSet.1.2	1.3.6.1.2.1.43.7.1.1.4.1.2	(integer)
prtLocalizationCharacterSet.1.3	1.3.6.1.2.1.43.7.1.1.4.1.3	(integer)
prtLocalizationCharacterSet.1.4	1.3.6.1.2.1.43.7.1.1.4.1.4	(integer)
prtLocalizationCharacterSet.1.5	1.3.6.1.2.1.43.7.1.1.4.1.5	(integer)
prtLocalizationCharacterSet.1.6	1.3.6.1.2.1.43.7.1.1.4.1.6	(integer)
prtLocalizationCharacterSet.1.7	1.3.6.1.2.1.43.7.1.1.4.1.7	(integer)
prtLocalizationCharacterSet.1.8	1.3.6.1.2.1.43.7.1.1.4.1.8	(integer)
prtLocalizationCharacterSet.1.9	1.3.6.1.2.1.43.7.1.1.4.1.9	(integer)
prtLocalizationCharacterSet.1.10	1.3.6.1.2.1.43.7.1.1.4.1.10	(integer)
prtLocalizationCharacterSet.1.11	1.3.6.1.2.1.43.7.1.1.4.1.11	(integer)
prtInputType.1.1	1.3.6.1.2.1.43.8.2.1.2.1.1	(integer)
prtInputType.1.2	1.3.6.1.2.1.43.8.2.1.2.1.2	(integer)
prtInputDimUnit.1.1	1.3.6.1.2.1.43.8.2.1.3.1.1	(integer)
prtInputDimUnit.1.2	1.3.6.1.2.1.43.8.2.1.3.1.2	(integer)
prtInputMediaDimFeedDirDeclared.1.1	1.3.6.1.2.1.43.8.2.1.4.1.1	(integer)
prtInputMediaDimFeedDirDeclared.1.2	1.3.6.1.2.1.43.8.2.1.4.1.2	(integer)
prtInputMediaDimXFeedDirDeclared.1.1	1.3.6.1.2.1.43.8.2.1.5.1.1	(integer)
prtInputMediaDimXFeedDirDeclared.1.2	1.3.6.1.2.1.43.8.2.1.5.1.2	(integer)
prtInputMediaDimFeedDirChosen.1.1	1.3.6.1.2.1.43.8.2.1.6.1.1	(integer)
prtInputMediaDimFeedDirChosen.1.2	1.3.6.1.2.1.43.8.2.1.6.1.2	(integer)
prtInputMediaDimXFeedDirChosen.1.1	1.3.6.1.2.1.43.8.2.1.7.1.1	(integer)
prtInputMediaDimXFeedDirChosen.1.2	1.3.6.1.2.1.43.8.2.1.7.1.2	(integer)
prtInputCapacityUnit.1.1	1.3.6.1.2.1.43.8.2.1.8.1.1	(integer)
prtInputCapacityUnit.1.2	1.3.6.1.2.1.43.8.2.1.8.1.2	(integer)
prtInputMaxCapacity.1.1	1.3.6.1.2.1.43.8.2.1.9.1.1	(integer)
prtInputMaxCapacity.1.2	1.3.6.1.2.1.43.8.2.1.9.1.2	(integer)
prtInputCurrentLevel.1.1	1.3.6.1.2.1.43.8.2.1.10.1.1	(integer)
prtInputCurrentLevel.1.2	1.3.6.1.2.1.43.8.2.1.10.1.2	(integer)
prtInputStatus.1.1	1.3.6.1.2.1.43.8.2.1.11.1.1	(integer)
prtInputStatus.1.2	1.3.6.1.2.1.43.8.2.1.11.1.2	(integer)

Table 16. PRINTER - RFC 1759 (continued)

OBJECT ID	MIB	TYPE
prtInputMediaName.1.1	1.3.6.1.2.1.43.8.2.1.12.1.1	(octet string)
prtInputMediaName.1.2	1.3.6.1.2.1.43.8.2.1.12.1.2	(octet string)
prtInputName.1.1	1.3.6.1.2.1.43.8.2.1.13.1.1	(octet string)
prtInputName.1.2	1.3.6.1.2.1.43.8.2.1.13.1.2	(octet string)
prtInputVendorName.1.1	1.3.6.1.2.1.43.8.2.1.14.1.1	(octet string)
prtInputVendorName.1.2	1.3.6.1.2.1.43.8.2.1.14.1.2	(octet string)
prtInputModel.1.1	1.3.6.1.2.1.43.8.2.1.15.1.1	(octet string)
prtInputModel.1.2	1.3.6.1.2.1.43.8.2.1.15.1.2	(octet string)
prtInputVersion.1.1	1.3.6.1.2.1.43.8.2.1.16.1.1	(octet string)
prtInputVersion.1.2	1.3.6.1.2.1.43.8.2.1.16.1.2	(octet string)
prtInputSerialNumber.1.1	1.3.6.1.2.1.43.8.2.1.17.1.1	(octet string)
prtInputSerialNumber.1.2	1.3.6.1.2.1.43.8.2.1.17.1.2	(octet string)
prtInputDescription.1.1	1.3.6.1.2.1.43.8.2.1.18.1.1	(octet string)
prtInputDescription.1.2	1.3.6.1.2.1.43.8.2.1.18.1.2	(octet string)
prtInputMediaType.1.1	1.3.6.1.2.1.43.8.2.1.21.1.1	(octet string)
prtInputMediaType.1.2	1.3.6.1.2.1.43.8.2.1.21.1.2	(octet string)
prtOutputType.1.1	1.3.6.1.2.1.43.9.2.1.2.1.1.1	(integer)
prtOutputCapacityUnit.1.1	1.3.6.1.2.1.43.9.2.1.3.1.1.1	(integer)
prtOutputMaxCapacity.1.1	1.3.6.1.2.1.43.9.2.1.4.1.1.1	(integer)
prtOutputRemaining.Capacity.1.1	1.3.6.1.2.1.43.9.2.1.5.1.1.1	(integer)
prtOutputStatus.1.1	1.3.6.1.2.1.43.9.2.1.6.1.1.1	(integer)
prtMarkerMarkTech.1.1	1.3.6.1.2.1.43.10.2.1.2.1.1	(integer)
prtMarkerCounterUnit.1.1	1.3.6.1.2.1.43.10.2.1.3.1.1	(integer)
prtMarkerLifeCount.1.1	1.3.6.1.2.1.43.10.2.1.4.1.1	(counter)
prtMarkerPowerOnCount.1.1	1.3.6.1.2.1.43.10.2.1.5.1.1	(counter)
prtMarkerProcessColorants.1.1	1.3.6.1.2.1.43.10.2.1.6.1.1	(integer)
prtMarkerSpotColorants.1.1	1.3.6.1.2.1.43.10.2.1.7.1.1	(integer)
prtMarkerAddressabilityUnit.1.1	1.3.6.1.2.1.43.10.2.1.8.1.1	(integer)
prtMarkerAddressabilityFeedDir.1.1	1.3.6.1.2.1.43.10.2.1.9.1.1	(integer)
prtMarkerAddressabilityXFeedDir.1.1	1.3.6.1.2.1.43.10.2.1.10.1.1	(integer)
prtMarkerNorthMargin.1.1	1.3.6.1.2.1.43.10.2.1.11.1.1	(integer)
prtMarkerSouthMargin.1.1	1.3.6.1.2.1.43.10.2.1.12.1.1	(integer)
prtMarkerWestMargin.1.1	1.3.6.1.2.1.43.10.2.1.13.1.1	(integer)
prtMarkerEasatMargin.1.1	1.3.6.1.2.1.43.10.2.1.14.1.1	(integer)
prtMarkerStatus.1.1	1.3.6.1.2.1.43.10.2.1.15.1.1	(integer)
prtMediaPathMaxSpeedPrintUnit.1.1	1.3.6.1.2.1.43.13.4.1.2.1.1	(integer)
prtMediaPathMaxSpeedPrintUnit.1.2	1.3.6.1.2.1.43.13.4.1.2.1.2	(integer)
prtMediaPathMediaSizeUnit.1.1	1.3.6.1.2.1.43.13.4.1.3.1.1	(integer)
prtMediaPathPathMediaSizeUnit.1.2	1.3.6.1.2.1.43.13.4.1.3.1.2	(integer)
prtMediaPathMaxSpeed.1.1	1.3.6.1.2.1.43.13.4.1.4.1.1	(integer)

Table 16. PRINTER - RFC 1759 (continued)

OBJECT ID	MIB	TYPE
prtMediaPathMaxSpeed.1.2	1.3.6.1.2.1.43.13.4.1.4.1.2	(integer)
prtMediaPathMaxMediaFeedDir.1.1	1.3.6.1.2.1.43.13.4.1.5.1.1	(integer)
prtMediaPathMaxMediaFeedDir.1.2	1.3.6.1.2.1.43.13.4.1.5.1.2	(integer)
prtMediaPathMaxMediaXFeedDir.1.1	1.3.6.1.2.1.43.13.4.1.6.1.1	(integer)
prtMediaPathMaxMediaXFeedDir.1.2	1.3.6.1.2.1.43.13.4.1.6.1.2	(integer)
prtMediaPathMinMediaFeedDir.1.1	1.3.6.1.2.1.43.13.4.1.7.1.1	(integer)
prtMediaPathMinMediaFeedDir.1.2	1.3.6.1.2.1.43.13.4.1.7.1.2	(integer)
prtMediaPathMinMediaXFeedDir.1.1	1.3.6.1.2.1.43.13.4.1.8.1.1	(integer)
prtMediaPathMinMediaXFeedDir.1.2	1.3.6.1.2.1.43.13.4.1.8.1.2	(integer)
prtMediaPathType1.1	1.3.6.1.2.1.43.13.4.1.9.1.1	(integer)
prtMediaPathType.1.2	1.3.6.1.2.1.43.13.4.1.9.1.2	(integer)
prtMediaPathDescription.1.1	1.3.6.1.2.1.43.13.4.1.10.1.1	(octet string)
prtMediaPathDescription.1.2	1.3.6.1.2.1.43.13.4.1.10.1.2	(octet string)
prtMediaPathStatus.1.1	1.3.6.1.2.1.43.13.4.1.11.1.1	(integer)
prtMediaPathStatus.1.2	1.3.6.1.2.1.43.13.4.1.11.1.2	(integer)
prtChannelType.1.1	1.3.6.1.2.1.43.14.1.1.2.1.1	(integer)
prtChannelType.1,2	1.3.6.1.2.1.43.14.1.1.2.1.2	(integer)
prtChannelType.1.3	1.3.6.1.2.1.43.14.1.1.2.1.3	(integer)
prtChannelType.1.4	1.3.6.1.2.1.43.14.1.1.2.1.4	(integer)
prtChannelType.1.5	1.3.6.1.2.1.43.14.1.1.2.1.5	(integer)
prtChannelState.1.1	1.3.6.1.2.1.43.14.1.1.6.1.1	(integer)
prtChannelState.1.2	1.3.6.1.2.1.43.14.1.1.6.1.2	(integer)
prtChannelState.1.3	1.3.6.1.2.1.43.14.1.1.6.1.3	(integer)
prtChannelState.1.4	1.3.6.1.2.1.43.14.1.1.6.1.4	(integer)
prtChannelState.1.4	1.3.6.1.2.1.43.14.1.1.6.1.5	(integer)
prtChannelIfIndex.1.1	1.3.6.1.2.1.43.14.1.1.7.1.1	(integer)
prtChannelIfIndex.1.2	1.3.6.1.2.1.43.14.1.1.7.1.2	(integer)
prtChannelIfIndex.1.3	1.3.6.1.2.1.43.14.1.1.7.1.3	(integer)
prtChannelIfIndex.1.4	1.3.6.1.2.1.43.14.1.1.7.1.4	(integer)
prtChannelIfIndex.1.5	1.3.6.1.2.1.43.14.1.1.7.1.5	(integer)
prtInterpreterLangFamily.1.1	1.3.6.1.2.1.43.15.1.1.2.1.1	(integer)
prtInterpreterLangFamily.1.2	1.3.6.1.2.1.43.15.1.1.2.1.2	(integer)
prtInterpreterLangFamily.1.3	1.3.6.1.2.1.43.15.1.1.2.1.3	(integer)
prtInterpreterLangFamily.1.4	1.3.6.1.2.1.43.15.1.1.2.1.4	(integer)
prtInterpreterLangLevel.1.1	1.3.6.1.2.1.43.15.1.1.3.1.1	(octet string)
prtInterpreterLangLevel.1.2	1.3.6.1.2.1.43.15.1.1.3.1.2	(octet string)
prtInterpreterLangLevel.1.3	1.3.6.1.2.1.43.15.1.1.3.1.3	(octet string)
prtInterpreterLangLevel.1.4	1.3.6.1.2.1.43.15.1.1.3.1.4	(octet string)
prtInterpreterLangVersion.1.1	1.3.6.1.2.1.43.15.1.1.4.1.1	(octet string)
prtInterpreterLangVersion.1.2	1.3.6.1.2.1.43.15.1.1.4.1.2	(octet string)

Table 16. PRINTER - RFC 1759 (continued)

OBJECT ID	MIB	TYPE
prtInterpreterLangVersion.1.3	1.3.6.1.2.1.43.15.1.1.4.1.3	(octet string)
prtInterpreterLangVersion.1.4	1.3.6.1.2.1.43.15.1.1.4.1.4	(octet string)
prtInterpreterLangVersion.1.1	1.3.6.1.2.1.43.15.1.1.5.1.1	(octet string)
prtInterpreterLangVersion.1.2	1.3.6.1.2.1.43.15.1.1.5.1.2	(octet string)
prtInterpreterLangVersion.1.3	1.3.6.1.2.1.43.15.1.1.5.1.3	(octet string)
prtInterpreterDescription.1.4	1.3.6.1.2.1.43.15.1.1.5.1.4	(octet string)
prtInterpreterVersion.1.1	1.3.6.1.2.1.43.15.1.1.6.1.1	(octet string)
prtInterpreterVersion.1.2	1.3.6.1.2.1.43.15.1.1.6.1.2	(octet string)
prtInterpreterVersion.1.3	1.3.6.1.2.1.43.15.1.1.6.1.3	(octet string)
prtInterpreterVersion.1.4	1.3.6.1.2.1.43.15.1.1.6.1.4	(octet string)
prtInterpreterDefaultOrientation.1.1	1.3.6.1.2.1.43.15.1.1.7.1.1	(integer)
prtInterpreterDefaultOrientation.1.2	1.3.6.1.2.1.43.15.1.1.7.1.2	(integer)
prtInterpreterDefaultOrientation.1.3	1.3.6.1.2.1.43.15.1.1.7.1.3	(integer)
prtInterpreterDefaultOrientation.1.4	1.3.6.1.2.1.43.15.1.1.7.1.4	(integer)
prtInterpreterFeedAddressability.1.1	1.3.6.1.2.1.43.15.1.1.8.1.1	(integer)
prtInterpreterFeedAddressability.1.2	1.3.6.1.2.1.43.15.1.1.8.1.2	(integer)
prtInterpreterFeedAddressability.1.3	1.3.6.1.2.1.43.15.1.1.8.1.3	(integer)
prtInterpreterFeedAddressability.1.4	1.3.6.1.2.1.43.15.1.1.8.1.4	(integer)
prtInterpreterXFeedAddressability.1.1	1.3.6.1.2.1.43.15.1.1.9.1.1	(integer)
prtInterpreterXFeedAddressability.1.2	1.3.6.1.2.1.43.15.1.1.9.1.2	(integer)
prtInterpreterXFeedAddressability.1.3	1.3.6.1.2.1.43.15.1.1.9.1.3	(integer)
prtInterpreterXFeedAddressability.1.4	1.3.6.1.2.1.43.15.1.1.9.1.4	(integer)
prtInterpreterDefaultCharSetIn.1.1	1.3.6.1.2.1.43.15.1.1.10.1.1	(integer)
prtInterpreterDefaultCharSetIn.1.2	1.3.6.1.2.1.43.15.1.1.10.1.2	(integer)
prtInterpreterDefaultCharSetIn.1.3	1.3.6.1.2.1.43.15.1.1.10.1.3	(integer)
prtInterpreterDefaultCharSetIn.1.4	1.3.6.1.2.1.43.15.1.1.10.1.4	(integer)
prtInterpreterDefaultCharSetOut.1.1	1.3.6.1.2.1.43.15.1.1.11.1.1	(integer)
prtInterpreterDefaultCharSetOut.1.2	1.3.6.1.2.1.43.15.1.1.11.1.2	(integer)
prtInterpreterDefaultCharSetOut.1.3	1.3.6.1.2.1.43.15.1.1.11.1.3	(integer)
prtInterpreterDefaultCharSetOut.1.4	1.3.6.1.2.1.43.15.1.1.11.1.4	(integer)
prtInterpreterTwoWay.1.1	1.3.6.1.2.1.43.15.1.1.12.1.1	(integer)
prtInterpreterTwoWay.1.2	1.3.6.1.2.1.43.15.1.1.12.1.2	(integer)
prtInterpreterTwoWay.1.3	1.3.6.1.2.1.43.15.1.1.12.1.3	(integer)
prtInterpreterTwoWay.1.4	1.3.6.1.2.1.43.15.1.1.12.1.4	(integer)
prtConsoleDisplayBufferText.1.1	1.3.6.1.2.1.43.16.5.1.2.1.1	(octet string)
prtConsoleDisplayBufferText.1.2	1.3.6.1.2.1.43.16.5.1.2.1.2	(octet string)
prtConsoleOnTime.1.1	1.3.6.1.2.1.43.17.6.1.2.1.1	(integer)
prtConsoleOnTime.1.2	1.3.6.1.2.1.43.17.6.1.2.1.2	(integer)
prtConsoleOnTime.1.3	1.3.6.1.2.1.43.17.6.1.2.1.3	(integer)
prtConsoleOnTime.1.4	1.3.6.1.2.1.43.17.6.1.2.1.4	(integer)

Table 16. PRINTER - RFC 1759 (continued)

OBJECT ID	MIB	TYPE
prtConsoleOnTime.1.5	1.3.6.1.2.1.43.17.6.1.2.1.5	(integer)
prtConsoleOnTime.1.6	1.3.6.1.2.1.43.17.6.1.2.1.6	(integer)
prtConsoleOffTime.1.1	1.3.6.1.2.1.43.17.6.1.3.1.1	(integer)
prtConsoleOffTime.1.2	1.3.6.1.2.1.43.17.6.1.3.1.2	(integer)
prtConsoleOffTime.1.3	1.3.6.1.2.1.43.17.6.1.3.1.3	(integer)
prtConsoleOffTime.1.4	1.3.6.1.2.1.43.17.6.1.3.1.4	(integer)
prtConsoleOffTime.1.5	1.3.6.1.2.1.43.17.6.1.3.1.5	(integer)
prtConsoleOffTime.1.6	1.3.6.1.2.1.43.17.6.1.3.1.6	(integer)
prtConsoleColor.1.1	1.3.6.1.2.1.43.17.6.1.4.1.1	(integer)
prtConsoleColor.1.2	1.3.6.1.2.1.43.17.6.1.4.1.2	(integer)
prtConsoleColor.1.3	1.3.6.1.2.1.43.17.6.1.4.1.3	(integer)
prtConsoleColor.1.4	1.3.6.1.2.1.43.17.6.1.4.1.4	(integer)
prtConsoleColor.1.5	1.3.6.1.2.1.43.17.6.1.4.1.5	(integer)
prtConsoleColor.1.6	1.3.6.1.2.1.43.17.6.1.4.1.6	(integer)
prtConsoleDescription.1.1	1.3.6.1.2.1.43.17.6.1.5.1.1	(octet string)
prtConsoleDescription.1.2	1.3.6.1.2.1.43.17.6.1.5.1.2	(octet string)
prtConsoleDescription.1.3	1.3.6.1.2.1.43.17.6.1.5.1.3	(octet string)
prtConsoleDescription.1.4	1.3.6.1.2.1.43.17.6.1.5.1.4	(octet string)
prtConsoleDescription.1.5	1.3.6.1.2.1.43.17.6.1.5.1.5	(octet string)
prtConsoleDescription.1.6	1.3.6.1.2.1.43.17.6.1.5.1.6	(octet string)
prtAlertSeverityLevel.1.1	1.3.6.1.2.1.43.18.1.1.2.1.1	(integer)
prtAlertTrainingLevel.1.1	1.3.6.1.2.1.43.18.1.1.3.1.1	(integer)
prtAlertGroup.1.1	1.3.6.1.2.1.43.18.1.1.4.1.1	(integer)
prtAlertGroupIndex.1.1	1.3.6.1.2.1.43.18.1.1.5.1.1	(integer)
prtAlertLocation.1.1	1.3.6.1.2.1.43.18.1.1.6.1.1	(integer)
prtAlertCOde.1.1	1.3.6.1.2.1.43.18.1.1.7.1.1	(integer)
prtAlertDescription.1.1	1.3.6.1.2.1.43.18.1.1.8.1.1	(octet string)
prtAlertTime	1.3.6.1.2.1.43.18.1.1.9.1.1	(timeticks)

prtAlertTable

prtAlertIndex.1.1 not accessible Interger32
1.3.6.1.2.1.43.18.1.1.1.1.1

prtAlertSeverityLevel.1.1 read only INTEGER
1.3.6.1.2.1.43.18.1.1.2.1.1

This MIB can assume the following values:

3 (critical) in paper jam, ribbon jam, afta error, print error, or machine check condition.

4 (warning) in paper out or cover open condition.

1 (other) in all other conditions.

prtAlertTrainingLevel.1.1 read only INTEGER
1.3.6.1.2.1.43.18.1.1.3.1.1

prtAlertTable

This MIB can assume the following values:

3 (untrained)	in paper jam or cover open condition.
1 (other)	in all other conditions

prtAlertGroup.1.1 read only INTEGER
1.3.6.1.2.1.43.18.1.1.4.1.1

This MIB can assume the following values:

6 (cover)	in cover open condition.
9 (output)	in ribbon jam condition.
13 (mediapath)	in paper jam condition.
5 (generalPrinter)	in all other conditions.

prtAlertGroupIndex.1.1 read only Integer32
1.3.6.1.2.1.43.18.1.1.5.1.1

This MIB can assume the following values:

0 (generalPrinter index)
1 (marker index)
2 (cover index)
3 (mediaPath index)

prtAlertLocation.1.1 read only Integer32
1.3.6.1.2.1.43.18.1.1.6.1

This MIB always assumes the value of 1.

prtAlertCode.1.1 read only INTEGER
1.3.6.1.2.1.43.18.1.1.7.1.1

1 (other)	in ribbon jam condition.
3 (coverOpen)	in cover open condition.
8 (jam)	in paper jam condition.
503 (powerUp)	in all other conditions.

prtAlertDescription.1.1 read only OCTET STRING
1.3.6.1.2.1.43.18.1.1.8.1.1

This MIB can assume the following values:

"Ribbon Lock"	in ribbon jam condition.
"Cover Open"	in cover open condition.
"Jam"	in paper jam condition.
"PowerUp"	in all other condtions.

prtAlertTime.1.1 read only TimeTicks
1.3.6.1.2.1.43.18.1.1.9.1.1

This MIB always assumes the value of 0, that is:
0 days 00h:00m:00s:00th

Appendix E. Printer Driver Support

Microsoft® Windows drivers

For network printing, be sure to install the 4247 Print Port for TCP/IP print port customization for your 4247 printer.

IBM pSeries AIX colon files

The 4247 L03 printer is supported on AIX 5.1 and greater using files that can be downloaded from our website. When these files have been installed, you will be able to add a 4247L3 as a printer device, and add virtual printers as a 4247L3 in five emulation modes: IBM 2391+, IBM Proprinter XL24, IBM Proprinter XL24 AGM, Epson EscP LQ, and Epson LQ 1600K. Automatic emulation mode switching is provided to allow support for multiple data streams on a single printer with different virtual printers. The following files are provided on the CD you received with your printer.

- IBM4247L3.TXT which contains installation information.
- IBM4247L3.LIC which contains license information.
- IBM4247L3.tar which contains the following files in a compressed tar file format.
  ibm4247L3_2391.readme - 2391+ emulation mode
  ibm4247L3_XL24.readme - IBM Proprinter XL24 emulation mode
  ibm4247L3_XL24ASGM.readme - IBM Proprinter XL24 AGM emulation mode.
  ibm4247L3_epson.readme - Epson EscP emulation mode
  ibm4247L3_1600K.readme - Epson LQ 1600K emulation mode

IBM System i workstation customization objects

To help you get started in attaching this ASCII printer to IBM Sytem i systems, “printer profile” source files to create a workstation customization objects (WSCST) can be downloaded from our website. A workstation customization object is similar in function to the printer function tables (PFT) used in workstations but used by the Host Print Transform function in the host. Two source files are provided. One is based on the IBM 2391 printer object for single-byte character set applications and the second is based on the Epson EscP printer object for double-byte and GB 18030 character set applications. The files have been customized with 4247 L03 unique commands to control the selection of paper paths (Drawer 1, 2), print qualities (Draft, Text, Letter), print densities (various pitches gbased on the FONT parameter), and various page sizes. The following files are provided on our website for this printer.

LICENSE.TXT - Licensing agreement
ZIBM424L.TXT - Source file for 4247 L03 workstation customization object for single-byte character set applications.
ZIBMESCP.TXT - Source file for 4247 L03 workstation customization object for double-byte character set applications.

Note: See the *Workstation Customization Programming*, SC42-3605 for detailed information about Host Print Transform and the installation of these files on your system. For additional information concerning Host Print Transform and the creation of additional workstation customization objects for this printer, refer to *AS/400 Printer Device Programming*, SC42-3713 or *AS/400 Workstation Customization Function Programmer's Guide*, SC41-0056.

Appendix F. The Remote Printer Management Utility

The Remote Printer Management Utility is a software tool for network administrators that allows the configuration and control of printers remotely connected to the Ethernet LAN.

With this tool the installed printers may be controlled, configured and organized easily.

The main features are:

Device Discovery	Searches for the devices within a range of IP addresses.
Printer Organization	The printers connected to the network can be organized into logical groups in a hierarchically structured tree.
Printer Status Report	Checks the printer's status and reports alarms.
Printer Configuration	The remotely connected printers may be configured as needed from the administrator's workstation.
Firmware Updating	Provides a firmware downloading function to upgrade both the base and the LAN card firmware.
Remote Operator Panel Management	Provides a virtual operator panel for the remotely connected printer at the administrator's workstation that allows to perform all functions normally achieved pressing the operator panel keys.

The Remote Printer Management Utility also provides the basic status management for third-party printers compliant to the standard MIB objects.

Operating System Compatibility

The Remote Printer Management Utility is a Java™ based application and can be run on any platform supporting the Java Run Time Environment version 1.6 or newer.

Notices

Thanks for choosing the 4247 printer.
Your printer is a reliable working equipment that will be very useful in your daily job.
Our printers have been designed to be compact and respectful of the work environment. They offer a wide range of features and multiple functions that confirm the high technological level reached by the printers with Compuprint brand.
To maintain these printing performances unchanged in the long run, Compuprint has developed specific consumables for each printer type that assure an excellent operation with high printing quality level reliability.
Compuprint srl recommends to use only its original consumables with original packaging (identified by its holographic label).
In this way, a proper use of the printer at quality level stated in the product characteristics can be assured.
All typical usage problems related to not certified consumables may be avoided, such as an overall quality print level degradation and, often, the reduction of the product life due to the fact that the proper working conditions for the print heads and other printer parts are not assured.
Moreover, Compuprint does not only certify its consumables in terms of working conditions but also carefully controls their compliance with the international standard rules concerning:

- no cancerous materials;
- no flammability of the plastic materials;
- other standards

Compuprint advises the customers not to use products for which the compliance to this safety rules are not warranted. Finally seek your dealer or contact a Compuprint office and be sure that are provided you the original consumables.

FFC Notes

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.
This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Compuprint is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment. This device complies with Part 15 of the FCC Rules.
Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

European Union (EU) Conformity Statement

Compuprint srl declares that this product is in compliance with the essential requirements and other relevant provisions of Directive 2006/95/EC, 2004/108/EC.
Per the applicable requirements of EU directive 98/37/EC (“machines”) sound pressure of the above product (measured according to EN27779) does not exceed 70dBA.
This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to European standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication devices. Important This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.
Properly shielded and grounded cables and connectors must be used in order to reduce the potential for causing
interference to radio and TV communications and to other electrical or electronic equipment.
Compuprint srl cannot accept responsibility for any interference caused by using other than recommended cables and connectors.

Industry Canada Compliance Statement

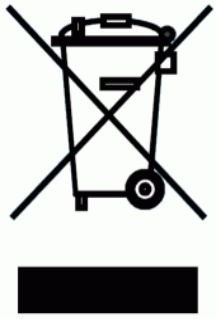
This Class A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A est conform à la norme NMB-003 du Canada.

Statement for CISPR 22 Edition 2 Compliance

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

User Information according to European Directive 2002/95/EC and 2003/108/EC

This unit must be recycled or discarded according to applicable local and national regulations.



The symbol shown on the left, applied to the product or on its packing, indicates that, at end of life, the product is not to be thrown away, or disposed as unsorted municipal waste, but separately collected.

Compuprint srl encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed.

Customer that needs to dispose this equipment must contact the produce and follow the collection framework available locally for the return, recycling and recovery of WEEE.

Customer participation to the separate collection is important to minimize any potential effects on the environment and human health, due to the potential presence of hazardous substances in the equipment, and aids the reuse and recycle of the materials by which the equipment is made.

Uncorrect disposal of the product by the customer will be punished according to the local regulations and Laws.

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